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TREATISE

In buying the Fowls choose always white-legged ones; their flesh is finer, and the skin more tender; they also look better at Table. The manner of fattening Fowls is, to separate them from the other Chickens; mix together some oatmeal, milk, boiled Potatoes and bread, add to the whole of it a little dripping; grind hot to give them too much at a time, and not more than twice a day; and above all, keep them very clean - when they are sufficiently fattened, kill them, or they will fall ill and die. When you find any of your Poultry sick, chop a few Leeks with their blood, which will cure them; but when they become very fat, if you do not kill them, they





TREATISE

ON THE

BREEDING, REARING, AND FATTENING

OF

POULTRY.

SECOND EDITION.

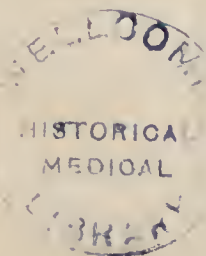
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TO THE
RIGHT HONOURABLE
LORD SOMERVILLE.

MY LORD,

To you, who have devoted so much of your time to the Public good, and from whom the United Kingdom has received such great benefit by your unwearied exertions, permit me to dedicate this little Book, confident you will make it useful, if it has any merit.

I have the honour to be,

MY LORD,

Your very humble Servant,

THE EDITOR.

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P R E F A C E.

THE following pages have been ushered to the world, with a view of introducing a general mode of treating Poultry, on the French plan, which is said in France to succeed : how far it will do so in this Country, must be left to those who derive pleasure or profit from the pursuit, to discover.

THE TURKEY.

TURKEY, (the) *Meleagris*, a species of bird, to which M. Latham assigns the following characters: bill conical and curved, and covered with spongy-like caruncles; a membranous and longitudinal caruncle on the throat; tail composed of quill feathers, and expansile; spurs to the feet. (S)

Next to the *common fowl*, *turkies* form the most numerous tribe, and at the same time the most useful of the farm yard. Like the fowl, they are strangers to our climate, and even to our continent. They came originally from America, and were brought to us towards the 16th century. The first eaten in France appeared at the marriage feast of Charles IX, in 1570. At that time they were already common in Spain, from whence they were introduced into England as early as 1525, in the fifteenth year of the reign of Henry VIII; they were in a short time spread over the whole kingdom, and bred to that degree, that in 1585 they could already furnish a dish in country feasts.

A popular tradition attributes to the Jesuits the introduction of *turkies* in Europe. (*Here follows a kind of panegyric on the Jesuits, which, as it does not at all apply to the subject in question, we have thought proper to omit.*)

They were first called the *India cock and hen*, because they came from the West Indies. This denomination was abridged, and they are now more generally known under the appellation of *turkey*, which name is also applied to silliness and ineptitude; the stupidity of the turkey is joked upon, and almost complained of; but we do not consider that if nature had gifted this bird with more instinct, intelligence, &c. it would not so easily have suffered itself to have been brought under subjection.

Turkies, however, are not so silly as it is thought; they are susceptible of very lively affections; and stupidity can only apply to those which are very dull and slow. If a new object comes in the way of the *turkey-cock*, he is immediately seen to quit his humble and simple countenance, fiercely trick himself up, swell his neck and head,

the fleshy parts of which colour up with a deeper red, bristle up the feathers of the neck and back, spread his tail like a fan, hang down the quill feathers of his wings till they drag on the ground, make a low buzzing, quicken his pace, then slacken it with a sort of gravity, and utter now and then a piercing cry, a precipitate quivering, which appears to be the expression of the greatest anger; it is an easy matter to make him repeat his *glou glou glou*, either by whistling, or any other sharp sound; the sight of a red coat puts him equally in a rage, and in the fit he flies at it, and attacks it with his bill, and does every thing in his power to remove the object which is disagreeable to him.

Most of these manœuvres of the *turkey-cock* take place also in the season of love; he then struts round the female, spreading his tail, and making that hollow noise and loud cry just mentioned. He does not want for spirit to gain the possession of a companion; he seems jealous of her, and engages with his rival, but with less fury than the common cock.

The male only has the power of expanding his tail, something like the peacock. He is also distinguished from the female by a tuft of hard black hairs, which hangs at the bottom of his neck, about 5 or 6 inches in length; by a spur, either shorter or longer, with which each of his feet are armed; by the long caruncle which he has at the base of the upper bill; by a stronger make; by his cries, and by being more in action. The cry of the female is but a plaintive accent. Their head, small in proportion to the rest of their body, is covered, as is also the upper part of the neck, with a naked skin, bluish, and encumbered with red nipples in front, and whitish on the back of the head; there are a few black hairs between these nipples, and some small feathers, still more rare, on the neck. A fleshy wrinkled caruncle, in the shape of a cone, rises over the bill from the insertion in the forehead. When the male bird is quiet, this caruncle is not above an inch long; but when he grows warm, it lengthens, and covers the bill entirely over, below which it falls two or three inches. At the base of the bill, underneath, grows a kind of waving red beard, hanging down as far as the third part of the length of the neck, which beard is composed of a double membrane. All these fleshy parts of the head and neck are red in the male, and of a paler hue in the female,

which, besides, has not the power of lengthening the caruncle on the top of the bill.

The openings of the nostrils are seen on the upper mandible, and behind the eye are to be seen those of the ears, covered over with small ruffled feathers. There are twenty-eight quill feathers to each wing, and eighteen to the tail; it is those which the bird expands when he spreads his tail; but there are others smaller, which form a second inferior tail, and which keep in a horizontal position. *Turkies*, like the fowl, have got a very muscular crop and throat; also an intestinal tube, about four times the length of their body, and two cœcum.

Although not of ancient date, the subjection of *turkies* has already produced some varieties in our climates. The most remarkable is that of the *tufted turkey*, as yet very rare, and whose tuft is sometimes black, and sometimes white. There are white *turkies*, others variegated, &c.

Those living wild in America, have invariably the colours of their species. They appear quite black; but on looking at them with some attention, it may be perceived that none of their feathers are entirely black; they are mostly all lightly waved with very fine strokes of a greyish brown colour; and the back presents, under certain aspects, changeable tints, shades of violet, which throw a radiancy over the plumage. As to the rest, these wild *turkies* are much larger and stronger than tame ones. Far from being improved by care and abundance of food, this species has grown uncommonly degenerate in our climate. Wild *turkies* weigh from 20, 30, 40, to 60 pounds. Bartram, an American traveller, describes one of these birds of a remarkable size; it's head, when it was standing upright, was above 3 feet from the ground; it's plumage of a dark brown, and the feathers on the neck, throat, back, and bend of the wings were edged with a copper colour, which certain reflections of light made to look like burnished gold. It was a fine haughty looking creature, and seemed not insensible to the admiration which it excited (*Voyages dans les parties sud de l'Amerique septentrionale, traduct. fr. tom. 1. pag. 46.*)

Wild *turkies* are found from the country of the Illinois to the isthma of Panama. Those birds which travellers have met with more to the south, and which they have taken for *turkies*, are Crax. They live mostly in forests; they subsist on wild fruits; that of the green oak fattens them very much. Their flesh is preferable to that of the

domestic *turkey*, on account of its flavour, which hardly falls short of that of the pheasant. These birds quit the woods in the month of September, and come nearer to inhabited places ; therefore the natives of north America call that season the *turkey month*. They hunt and kill a great number of them, and get them frozen in order to preserve them, and carry them to the European settlements. Wild *turkies* are now to be met with only at great distances up the country ; they are very shy, and although they fly heavy, they know so well how to escape and hide themselves, that there is some difficulty in finding them. Those reared in their native place, ranging freely, and never cooped up, have become as weak, as feeble, and in a word have degenerated in the same degree as those in the farm yards of Europe. This argues in this species a great love of liberty, which surely is not the symptom of a stupid nature.

I have spoken of the *turkey* of nature ; the following article treats of the *turkey* of art ; that is, of the *turkey* which makes so interesting a part of our rural and domestic œconomy. (S)

TURKEY, (the) (*Œconomy*) brought from the West-Indies into France, in the reign of Francis I ; the *turkey*, is, next to the common fowl, the most useful of domestic birds, and at the same time that which requires the greatest care in the first moments of its existence ; when once reared, however, every temperature agrees with it ; and although it comes from the hot countries, it is so naturalized in the most northern parts of Europe, that one would now think that those parts of the globe were its native place ; he is therefore a true citizen of the world.

Although this bird has a great number of partizans, some detractors have, however, now and then shown themselves, whose assertions, merely hazarded, might injure the propagation of the species, if those objections, made at different times against the advantages which might accrue to the inhabitants of those countries the most favourably situated for rearing them, were left unanswered.

It has often been repeated, that extreme difficulties occurred in rearing the *turkey* ; and that when, by dint of pains, one had succeeded so far as to secure them from those accidents which threaten them till the time when the red shoots, the expenses they afterwards incurred to bring them to a desirable plumpness, exceeded the

produce of the sale; this was sufficient to deter farmers from admitting this bird into the farm yard, and they have consequently been deprived of a sure means of increasing the resources of the house, and at the same time of adding to the revenues of the rural domain.

I shall content myself with observing with Chalumeau, that if the essays which have hitherto been attempted in certain districts to rear *turkies*, have not been crowned with any success, it is entirely owing to the unskilfulness and inexperience of those to whom they have been intrusted.

Laborious efforts are not here required, but some care and a little patience. As long as it is persisted in thwarting the females when setting, in opening the shells of the eggs in order to help the passage of the tardy chicks, in pressing and handling them as soon as born, to make them eat against their will, in leaving them exposed to intense heat or cold damps; so long will their death be the undoubted consequence of such usage in the course of a month; it is then less trouble to say that the bird is difficult to rear, than to accuse oneself at once of negligence, unskilfulness, and barbarity.

A truth, which cannot be too often repeated, is, that if the farmer's wife disdains to be especially busied with the poultry yard, if she does not adopt for the birds, which are there collected together, a mode of education, regulated by the natural temperature of their body, by the nature of the soil, by local resources, and that if, in the number of her servants, she does not study to form one capable of seconding her, and even of being in her stead, in the particulars of this government, they will become a source of expense to the house, rather than of profit or utility.

It must be confessed that if grain merely were given to *turkies*, greedy as they are, these birds would merit the appellation of *wheat-coffers*, which they bear in certain cantons. But are there not other means of feeding them better and cheaper? How many different sorts of offal would otherwise be quite lost on the fields and in the house, but for these birds, who consume them? Must they always be glutted before the proper time, when they are to be fattened for sale?

But these dreaded cares are not so weighty as has been pretended. They are merely these.—In the first days of the life of the *turkey*, to secure this bird from the

alternatives of heat and cold, of dry and wet, to give it proper æconomical food, and not to lose sight of it till the red shoots. It is then only that he appears to be inured to the climate, that his constitution is formed, that he braves the severity of the seasons and every local influence.

Varieties of the Turkey.

The colour of this bird is usually black ; white *turkies* have however increased, and their mixture has produced a great number of varieties.

Many people think the white *turkey* more robust, more easy to rear and to fatten. It is for this reason that, in some parts of France, large flocks of them are to be seen. Others, on the contrary, pretend that it is the black feathered *turkies* which unite these qualities ; but as yet it does not appear that experience has been able to ascertain any great difference between the one and the other. An opinion generally adopted though, is, that the skin of the latter is commonly whiter, the flesh finer and sweeter ; that the males are of a larger size, and the females better breeders ; they are therefore always preferred in our markets to the white or tufted *turkey*, which the more intelligent of our housewives even refuse to rear, persuaded as they are that the first are more profitable.

It is a pretty clear fact, that black *turkies* are always reproduced in a greater number than those of any other colour ; and that in Dauphiny, where they exist of every shade and colour, from a deep black to white, no great difference is remarked in their education, or in the result ; but those shades, more or less strong, are they really a degeneracy operated by crossing, or by the climate ? Experience has not as yet decided this point ; it is however a fact, that Madame Clavier, who formerly made it the special object of her diversion to practice rural æconomy, and who has consequently set a very commendable example to those around her ; this amiable woman has had for a long time in the Gatinois, a white *turkey cock*, who alone served ten black females, and who has never given a single chick of it's colour, or even shaded in the slightest degree. A final observation is, that those wild *turkies* which are preserved in those collections of natural history which I have visited in England, are black ; and that those sold as such by the London bird-dealers, are equally of a fine black.

Habitation of the Turkey.

As in the breeding of animals, their instinct must be always attended to as much as possible, and that it is perhaps by setting this too much aside that their tribes degenerate, and become more liable to accidents and diseases unknown to the wild state; it is necessary in the first instance to procure a wholesome habitation for the *turkey*, and to keep it clean. Their propensity to perch in the open air, and on high places, being already pointed out by nature, is a sufficient reason for constantly attending to this point in the bringing up of these birds.

As the perches which serve for the common fowl to roost on in the hen-house, cannot support the turkey, these must necessarily be three times as thick, and small gratings made in those places on purpose for them; excepting, however, when severe cold, which freezes their feet, is to be feared; or if liable to be devoured by animals; or lastly if the thief strolls about the farm in order to commit depredations on the same. Turkeys are then always in a much better state of health, and their flesh becomes firmer and sweeter; they are less exposed to disease, profit more, and do not contract any ill taste, which happens to those lodged in hen houses which have no air, are narrow, and full of vermin and dung.

There is another proof, equally evident, that the *turkey* requires an open air, which is, that hardly has the red begun to shoot, when he begins to show a desire of perching in the open air; but this must never be suffered before that time, that is to say, when they are 2 or 3 months old. Open sheds are best suited to them. To this effect roosting bars must be fixed at a few feet above the surface of the ground, on which they rest. By these means the air that surrounds them is constantly renewed.

To the proofs already adduced on the advantages for *turkies* to perch in the open air, we may add, that when they have passed the night in close and filthy hen roosts, and that the door be opened to them, they rush out so eagerly, that nothing whatever could oblige the bird to do thus, but the uneasiness he has experienced by being so shut up, and the want he is in to escape from imminent danger. They must therefore be preserved from the effect of their own infection, by giving them a more roomy habitation, by frequently renewing their litter, by

burning therein, after having shut close doors and windows, some combustible matter capable of giving a clear flame as well as smoke, and not as some authors advise, who recommend for this purpose the use of aromatic herbs and vinegar, whose vapour only contributes to vitiate the air, and adds to the unwholesomeness of the habitation.

Of the Turkey Cock and Hen.

The features which distinguish the male from the female, are not easily come at, especially before they have got what is termed the *red*. It has merely been observed, that for several days after the bird had come out of the shell, the female was larger than the male, but that by degrees their sizes became equal. The male then begins to stand higher on the legs, which lengthen, and are stonger than those of the female, who, besides, has no spurs, neither does she spread her tail like the cock.

The choice *turkey* cock and hen must be very lively, have short legs, a full shape, great vivacity and energy in all their actions. Both must be particularly well made, and very fit for breeding.

Some housewives, persuaded that the hen, in order to bear the approach of the cock, and to augment her fecundity, requires the assistance of food different from that usually given to her, make a practice of giving her oats or seed, on those days preceding the season of love; but the *turkey* stands in need of no stimulus whatever. It is the most lascivious bird in the farm-yard; it would perhaps be dangerous to excite it by heating food; for the consequence would be a too frequent repetition, which would produce clear eggs.

The plumpness or leanness of the hen, the climate or localities, will alone forward or retard her laying. By feeding and taking proper care of her in winter, she will be disposed to lay earlier in spring, and to begin afresh at the end of summer. Nature seems to have taken all the trouble on herself.

Though one has but a certain quantity of turkies, one is obliged to have a proportionate number of cocks. Twelve females must have one cock, but if it be true, as some observations seem to prove it, that once treading is sufficient to fecundate the whole laying, there is no doubt that, although the expense of a cock be not very great, it might be sold to great advantage immediately after the laying of the eggs.

Of the Laying.

The *turkey hen*, notwithstanding what Buffon says, almost constantly lays twice a year; the first time is after winter, the second towards the end of summer, sooner or later, according to the care that has been taken of her, the season, and localities; she lays in the morning, every two days, sometimes every day, from fifteen to twenty eggs. A female two or three years old, produces more, and almost constantly larger eggs than those of a hen only one year old.

As the laying is an infallible sign of the health of a bird, one may judge by her vivacity and haughty strut, that the hen draws near the moment when she is to fulfil that important function; but she then makes it known by her endeavours to avoid the eye and vigilance of the keeper. She has, besides, a cry which foretels her wants, and which the intelligent housewife can never mistake: she must take that opportunity to keep the females in their house, where she must have previously prepared suitable nests for them, and in each of which she will have taken care to lay a false egg, to determine their choice.

Nothing is easier ascertained if the hens are ready to lay; it is enough every morning, before they are let out, to feel them one after the other, to make sure of those which are to lay in the morning, to keep them back till they have laid, and let the others go. By these means the hens are accustomed to their nest, and no eggs are lost; but it is rather difficult to hinder them from laying abroad when they roost in the open air.

The eggs must be taken up as soon as laid, lest the hen, naturally heavy and awkward, break them in laying down on the nest; but the caution recommended for laying them aside, in order to give the setter only her own eggs, does not appear to me to have any weight. Is it not well known that the *turkey hen*, which sits indiscriminately on the egg of the common fowl, the goose, or the duck, succeeds at least as well as the females that have laid them.

The eggs of the *turkey hen* are larger and more lengthened than those of the common fowl, speckled with reddish spots, mixed with yellow; they keep very well in a basket filled with rye-bran or oat-straw, and especially when they are not liable to be shaken, and when kept by themselves. The basket should hang in a very

dry place, cool, and dark, till the hen leaves off laying; those eggs, bearing the date of their lay, are not reckoned old; but if older, they would be equivocal for the setting.

There are seldom more than a dozen eggs to the second lay, and even then, in order to have a good issue, care should be had to take the chicks from the female as soon as hatched, and give them up to another mother, who willingly takes charge of the two families. This second lay may then be compared to the first, not only in regard to number, but also with respect to the chicks proceeding from it, and whose good success can scarcely be insured but in the most southern parts of France, where it is possible to obtain as much as three lays, and very easily two broods; which applies to the partridge and other vivaporous animals of the forest. If the eggs of the first lay be taken away, a second may be depended upon; because they have had time to recruit their ovaries: this is why young tardy partridges are every where to be met with; which, to be sure, are never so lively as those resulting from a first brood.

During the whole time of laying, care must be taken to separate the male from the female, in the morning at least, for that is usually the time when she lays; for if he meets with her on the nest, he ill treats her, drives her away, and breaks her eggs: it is also prudent to keep him away when she is sitting. The cock is not by nature designed to share the solitudes of brooding, not less important than laying, which must never be thwarted; for, in these two last instances, the *turkey-hen* being timid, the utmost care should be taken not to disturb it in any manner.

Of the Setting.

Before the *turkey-hen* has even completed her laying, she shews a wish to set by unequivocal signs; she clucks like the common fowl; the breast and belly grow bare. The *turkey-hen*, in this state, is truly remarkable; her little artifices to conceal her eggs: her tricks in attempting to deceive those who might feel inclined to find out her nest, should seem to place her on a line with those animals endued with a natural instinct; but what brings her back to the rank of the brute, is her manner of setting. In fact, although her eggs be constantly taken

from her, she sets with the same solicitude on any strange body whatever.

This desire to set is so violent, so imperious with her, that she not only keeps to the nest, although her eggs be taken from her, but she there remains immoveable, and forgets to take any food; she would even set upon stones, and remain on them equally the same; she would perish there to a certainty, were not her own eggs, or those of some other bird, returned to her. It is therefore a matter of consequence that she be satisfied; for setting without eggs, such false labour would fatigue her more than that whose object is the propagation of the species. Eggs put all at once under the setter should be first marked with charcoal, in order to distinguish and separate those she still lays, after having began to set, and which, were they at all slow in hatching, would be most certainly abandoned by the mother, who willingly leaves the nest as soon as she perceives any chicks; it is moreover expedient to examine them by candle-light, to be certain that they be fecundated.

We have already premised that the *turkey-hen* stood in need of no stimulus to lay; we do not think it necessary to employ any to excite it to set. There are some though who are not inclined to it by themselves, and to whom it is proper to give a longing: to this effect they are placed on a nest filled with eggs, in a close, quiet place, and it may almost be depended upon that they will not quit it.

This may be done with still more certainty, as follows: the bellies of the females are dipped in cold water, plucking the feathers from underneath it, and flogging them with a sprig of nettle, keeping them warm on a layer of straw; they may be also made drunk with bread soaked in wine and a little brandy; and in this state of intoxication they are placed on those eggs intended for them. On recovering, they seem to have already taken an affection for them; they continue to set on and take care of them, and become as good mothers as those who had shewn the greatest disposition to fulfill the duties of that situation.

Of Nests for Setting.

The setters should be all kept in the same place, without its being necessary to separate them by partitions; it is enough that each have a nest; yet at some distance though

from each other, so that they may not perceive themselves, because they might rob one another of their eggs. The place must be dry, warm, and dark, or hidden by a particular shelter, having a small separate yard adjoining, where the chicks may be safe in the first days of rearing.

The nests for setting may be laid in the corner of their habitation, by throwing some straw to take off the damp of the earth, on which is laid an old straw mattress, sufficiently stuffed, not high, and pretty thick, so that they may get up and down with ease, without breaking the eggs. The nest must be formed of a circular pad, or roll, stuffed with matted straw, and about fifteen or sixteen inches in diameter; the inside must be filled with soft bruised straw, on which the eggs are laid, which being secured by the border we have just spoken of, do not roll about the nest, when the setter makes a motion to get in or out of her nest, or to turn her eggs.

When *turkey-hens* have been left to themselves during their laying, and have chosen a nest at a small distance from the habitation, there is hardly any thing to be done; they leave it with difficulty; it is even prudent not to thwart them, for they generally bring about their own brood safely, and the young ones are the stronger for it; but unfortunately the rapacity of man, and hurtful animals, surround these broods with many dangers, which, without these inconveniences, ought once again to be left to the setter.

Requisite Cares when setting.

We have often recommended to keep clean the place where the *turkey-hen* sets, and to take care she does not mure in the nest, which would infect the eggs; but a good mother does nothing of the kind; she mures only when she takes her food, and care must be taken to cleanse it thoroughly.

Where there is a certain number of *turkey-hens*, it is not necessary to wait till they have all done laying for to make them set together. When the weather is unseasonable, one would run the hazard of losing all in a single moment. It is, however, advantageous to put several to set at once, so that if any accident happen to the setter, it may be remedied by giving up to another those eggs that are hatching, or ready hatched; besides, the young ones being all of the same strength, they do not starve the weaker ones. It is easier and more saving

to rear them in this manner, in flocks, under the direction of a number of *turkey-hens*, than to leave each family to its mother.

Another advantage derived from this practice, is to determine the females to set a second time on the common fowls' eggs; or still better, to recommence laying a second time. In fine, when two broods of young ones are given to one *turkey-hen*, it is a means of procuring repose to the weaker one, and of obtaining sooner a second laying of her.

But when eggs, or chicks, are about to be slipped under another setter, it must be done so that she does not perceive it, the evening being the proper time for this intromission, so that on the morrow the new comers may appear to be of the family. This single caution is also sufficient in substituting other eggs, and taking from the setter those on the point of being hatched.

The *turkey-hen* takes and sets on the fresh eggs given her without the least difficulty; but it is proper not to give her more eggs than she can possibly set over and heat with the body.

The timidity of the *turkey-hens*, when setting, requires that none other approach them but the person who usually gives them meat and drink, either near the nest, or outside the habitation. Every day, at the same hour, the oviparous species, when brooding, regularly appear to turn their eggs, to bring those in the center to the circumference, and, *vice versa*; many housewives are in the habit of watching their opportunity, when the *turkey-hen* is feeding or taking a little exercise, to share this care with her, by means of which the heat is more uniformly imparted. They get up and down from the nest without ever mistaking, turn their eggs, and rarely break them, although naturally heavy and clumsy.

In fact, this care must be left exclusively to the setter. Have a care not to touch those eggs half-hatched, unless they be found out of the nest; in which case they must be carefully replaced. How many broods have been lost by not properly attending to these cares! Nothing thwarts and disturbs the females more than to meddle with their brood till the moment they are hatched.

The *turkey-hen*, after finishing her laying, can set either on ducks, geese, or fowls' eggs, observing that the two first being four weeks hatching, and those of the fowl three, consequently these last must be put under

the mother a week later, so that they may be all hatched almost in one day. But it is remarked, that these eggs do not constantly answer, by reason of their being of an unequal size, and their shell more or less hard, they can with difficulty receive the same degree of heat; besides the different affections of the young ones disturb the tranquillity of the mother; it is better only to give her one sort of eggs; a particular case, however, excepted, in which it might be, perhaps, useful, as we shall mention in a moment, to add constantly to each brood of *turkies* two or three eggs of the common fowl. Thus, by three or four good *turkey-hens*, the whole farm-yard might, in a short time, be stocked with poultry.

In those farms where a great quantity of poultry is wished to be reared, there is great advantage in keeping *turkey-hens* on purpose to set, the more so, as, of all setters, they are the most patient and assiduous. When the brood of chicks is hatched, the young ones may be given to another mother, and a double number of fowls' eggs dexterously slipped under her, which, as they only take one and twenty days to hatch, do not fatigue the setter so much as would two broods of her own eggs, one after the other; besides the way to get early pullets is by giving up the brooding of them to the *turkey-hen*, whose laying is sooner over than that of the common fowl, and to put her in a way of having the second lay.

To turn to advantage the time when the *turkey-cock* reposes, it has been attempted to use him to setting, as the capon does. The repeated experiments I have tried have fully proved to me, that when he had been constrained to it by every possible stratagem, he acquitted himself in such a manner as to deserve to be compared, for his assiduity in constantly remaining on the eggs, to the true setting mother. But when the young ones appear their cries and motions scare him, and he either kills or abandons them.

Although the *turkey-hen* is rightly styled a patient and attentive setter, it sometimes happens, that in the number there may be some who eat their eggs, in which case there is nothing to be done but to get rid of them, and their eggs put under another mother, whose appetite is less depraved.

It is asserted, with respect to the two broods that the *turkey-hen* can produce, that the females resulting from these eggs are not apt to set; the error probably arises

from having put young hens from this brood to set ; and it is well known, that if young hens lay soon, they rarely set well.

Of Turkey Chickens.

According to the assiduity of the setter, it is on the thirty-first or thirty-second day of setting, that *turkey-chickens* issue from their prison ; but as they are not born altogether, the housewife must put them successively in a wicker basket, filled with wool or feathers, which she must deposit in a warm place, and sheltered, especially in cold weather. When the brood is entirely come out, if the *turkey-hen* is not immediately to make a second, the little ones are given back to her, care being taken to supply them all with meat and drink.

In the number of chickens which compose the brood, there are some which, slow in hatching, seem to require a little help to get out. The egg then must be taken up and attentively considered. If there appears a mark, or small hole, through which the bill of the chicken can be seen, the shell must be broken very slightly on the outside, lifted up with the nail, or the point of a pin, so as to make the hole wide enough for the head to pass, taking care not to touch the animal, who would immediately die ; he must be drawn gently out of the shell and blown upon to take off the slime that covers it. Eggs, nearly hatched, are also sometimes put in warm water before the birth of the chick. This custom softens the shell, and shews whether the little one is dead or alive.

Those eggs which, on the third or fourth day of hatching, do not present at either of their extremities that clear point, or small hole, through which the chicken may be perceived, will produce none ; they must be thrown out of the nest as soon as possible, as also the remains of shells, because they would spread a prejudicial infection, and might hurt the young ones.

But if there are circumstances in which the animal requires help to get out, when he is kept back by some obstacle which he cannot conquer, without the help just pointed out, it must be administered with much circumspection, and the operation here alluded to must only be resorted to but when the chicken has already made an opening insufficient for the passage of the head ; it is not less important to disencumber new-born chickens

from a pellicle with which the inside of the shell is lined, as also of that yellowish slime which covers the extremity of the upper bill; that matter is something like a grain of hempseed, and bears that name.

If in the latter days of setting a thunder-storm should come on, it often happens that the little ones perish in the shell through weakness, or by suffocation; and if one succeeds so far as to extract some, they are commonly stifled under the mother. This accident must be remedied by putting the hatched eggs in a basket, filled with feathers, covered with a cloth, and laid pretty near the fire, in order to keep up a degree of heat near to that produced by setting. These simple means are not only liable to favour the birth of the chicken, they can equally bring to life the little ones which the cold or damp has seized, at a distance from their mother. We shall quote an instance at the end of this article.

The instant the *turkey-chickens* are hatched, it is pretended that it is a custom in Sweden to plunge them in cold water, and to make them swallow a pepper-corn to strengthen them; that in other countries their legs are plunged in wine during eight days, and that they even take a few drops.

These various customs may suit when the young ones are weak and drooping. In this case, the pepper-corn, as does also the drop of wine, re-animates and warms them, excites their appetite, and disposes them to take their first nourishment. But let us be allowed to observe, that it is by not leaving nature to act that she is oppressed, under a pretence of helping her. Our impatience does a good deal of mischief; we are then of opinion, that when the weather has been favourable for hatching, the eggs must not be touched; that the use of the cold bath and the pepper-corn are perfectly useless. Wine alone is not to be neglected.

It is well known, that birds on leaving their shells quit a warmth of twenty-five to thirty degrees, and that they often pass through a medium whose temperature is inferior by half; therefore, in the beginning of his existence, the new-born chick remains under the wings of his mother, where he finds the warmth nearly equal to that he had in the egg; by making him leave this shelter to handle him, to bathe, and make him swallow pepper, he passes too suddenly from heat to cold, from rest to exercise; and this sudden change, hurtful to animals

grown up, becomes more especially so to the *turkey chicken*, whose natural delicacy and want of feathers render him more sensible to these transitions.

The food for chickens is first, bread crumbled and soaked in wine. It is given to them in the hollow of the hand, afterwards on a pallet; white cheese is mixed with it, or curdled milk with hard eggs, male nettle and parsley, chopped up and made into a paste, more moist than dry, laying it out on small, broad, flat stones, three or four inches by two in width. The little ones are divided into flocks of a small number, they are hindered from tormenting one another; by these means their feet and plumage are prevented from sticking together, such inconvenience being as much against their health as the beauty of their coat.

Although male nettle and parsley are the most wholesome plants for *turkey chickens*, and are every where to be met with, bramble may be substituted to these when not to be got at. They are mixed with barley-meal, beans, maize, according to local resources. They are made into balls about the size of the fist, which the housewife holds out in her hand to the chickens. They then press and place themselves around her, and peck at this paste till they are full. The housewife's girl must be careful to give it them several times a day, as often as they digest. Water is given them to drink in shallow vessels.

An essential caution to secure to the chickens the paste, which the *turkey-hen* takes from them, and who during the setting eats but little, but comes to her first voracity as soon as she has little ones, is to put a hen-coop near her, raised about three or four inches from the ground, so that they may pass under to take their food, which is laid in such a manner, as that the mother cannot get at it by lengthening her neck; barley or oats are strewed around it for her, and her water is in a low vessel, for fear the chickens should drown themselves in it, or wet the upper part of their legs, which is very hurtful to them. When the chickens have been penetrated with the warmth of the sun during two hours, they must be turned in, and kept out longer the next day. They will be thus accustomed to the open air, till they become vigorous and can help themselves. If the place in which they are left at liberty with their mother be too extensive, she must be tied with a string to a post, the young ones go but little from her,

and above all, a shed should be placed near her, made of boards, and supplied with straw, to shelter them from a sudden storm, or a hot drying wind. The scorching sun and the rain are, above all, hurtful to them, and it must be an indispensable care to shelter them from the one and the other, at least, during the first six weeks.

As the chickens, at the moment of their birth, give no signs of seeking their food, and as they are not instructed in the least so to do by the mother, who seems to be more taken up with their own preservation, some impatient housewives have thought it best to feed them; but however clever a housewife's girl may be in this way, it is always hazardous, for the animal's bill is subject to be broken; it is in this instance that it appears necessary to admit two or three eggs of the common fowl to those of the *turkey-hen*, ten days after setting, so that the young ones may be hatched at the same time; as the common chickens peck and eat as soon as out of the shell, they become, for *turkey-chickens*, an example which they imitate, and which determines them to eat a few hours sooner, which is of some use.

This dangerous practice of feeding them has, however, found some partisans, and Rozier among others. But he seems to have been led into an error, for Saint Genis, that enlightened husbandman, who always speaks from his own experience, very judiciously remarks, that one must not be in haste to make the *turkey-chickens* eat; that when they are taken from under their mother to be handled and fed, they perish sooner or later, on account of the difference of temperature through which they pass so suddenly; he suspects that these birds, more than any other, should be left to mere nature, and that these excessively delicate beings must not be taken from warmth and repose.

It is a very plain fact with all domestic birds, that they do not come out of the shell all at once, and that often in the very same brood there is a distance between the first and the last born. Saint Genis has moreover observed, that hardly are they born when they keep under the mother, and shew no desire to take any food; he concluded from this, that animal warmth was without doubt infinitely more necessary to them than food. His experiments have led him to this opinion, to wit: that two or three days pass over before going to seek their food, but that they afterwards peck very well, and absolutely stand in no need whatever of any foreign help.

When the chickens have come to a middling size, and can leave the yard where they have been reared to go into the fields, meadows and woods, several broods may be gathered together under the conduct of a *turkey-hen*, and so form but one and the same family; observing, however, that there be not a too great disproportion of age, nor in too great numbers, for if she perceived any large ones mixed with others a great deal smaller, she would peck at and kill them; besides, assembled in too great numbers, they could not be warmed and enlivened under her wings: now, animal heat is a fresh setting.

High places, exposed to the aspect of the East and South, are those which always agree best with the chickens, especially when they have a small separate yard, which guards them from the attacks of the larger poultry, and other animals of the farm-yard: from thence they might pass into some pasture-land, or uncultivated places, covered with wood and bushes, where they could find plenty of insects, and shelters against the wind, the rain, and the too intense heat of the sun.

Turkey-hens are not only the most assiduous setters on all sorts of eggs, they are, moreover, preferable to any other female bird in the farm-yard, for leading the little ones of different families; they shew the same regard for them as for their own, no bird of prey or wild animal dare approach; the common chickens led by a *turkey-hen* find food in greater abundance and fatten sooner; they leave their nurse-mother later than if she were a common fowl.

The food which has been spoken of, is continued to be given to them till they can digest something more substantial; it is then a custom to let them go into the fields: after harvest-time, they find corn on the ground, which they pick up; they must then be made to drink more frequently, especially when the heat is great; and care taken when they stray from home, that they are not caught in storms or rain; they are so fond of the shade in summer, that they run eagerly to hide themselves in thickets, but they must be prevented from remaining there too long, for experience has often made it appear that they issue therefrom with sprained legs, get lame, and are stunted in growth.

Of Young Turkies.

The weak state of the first stage of the chickens lasts, in general, for two months, or till the nipples which the

neck and head are supplied with become of a dark or light red. That remarkable time in the natural history of this bird, is really a critical one for them; the dangers which surround them during their feeble youth, diminish, and they loose the name of chicken for that of *young turkey*.

Nature, by colouring their nipples, seems to tell us that these birds are no longer in need of those unceasing cares which have not been spared towards them; and that to favour this eruption, the same cares must still be prolonged, the food increased and rendered more tonic, by adding the yolks of eggs, wine with crumbled bread, wheaten flour, bruised hempseed, &c.

After the shooting of the red, which must be looked upon, as I have already observed, as the time of their being seasoned, the *young turkies* go into the fields with their mothers, who are not long before they are busied with a fresh laying, they mix without danger or difficulty with the *turkies* of the preceding years, if there happens to be any. They roost in the open air, on trees, or on the roost prepared for them; they may, till the month of October, be led into fallow fields, meadows, vineyards, after harvest-time, mowing-time, and the vintage; in the woods after the falling of the acorn and beach-mast; in short, in every place where there is wild-fruit, insects and corn to be picked up; but they must, above all, be kept away from vineyards when the grapes are ripe, for hail cannot do more mischief; they return home to the farm in the evening, well stuffed with all the insects they have swallowed and rid the fields of, with the corn which has escaped the hand of the gleaner, and a quantity of substance which would be absolutely lost to the proprietor.

A girl from twelve to fifteen years old, can easily manage a hundred *young turkies*, but she must be charged not to forget that not having attained their full growth, they would be fatigued by too distant rambles. No food makes their flesh whiter and more delicate than the residuum of melted tallow and kitchen-stuff, more or less must be boiled, according to the number that is to be fed; when this residuum is well divided, it is diluted in a boiling kettle, plants, and especially nettles chopped up, and pot-herbs are mixed with it. The whole being well boiled, barley-meal or maize is added, of which is made a sort of paste, which is given to the *young turkies* twice a day at least, in the morning and at one o'clock, when

one wants them to get fat. But as the residuum of tallow is not every where to be procured, the dregs or refuse of the oil of nuts, linseed, or sweet almonds, is a succedaneum; but the greatest care must be taken not to fatten them with it, for their flesh would partake of it.

Independant of the male nettle, parsley, every plant which is allowed to posses tonic and stomachical virtues, agrees particularly well with *turkeys* of every age; fennel, wild succory, mil-foil, may enter into the composition of their food. A scorching sun is fatal to these birds, as well as rain, therefore intelligent turkey-keepers take care to lead their young flocks to pasture, only during the moderately warm hours in the day, the morning, when the dew is gone off, and the evening, before it comes on, namely, from eight o'clock till ten, and in the evening, from four to seven. It is proper, that young *turkies* should find some shade in their walk, and on the least sign of rain haste should be made to turn them into their habitation, and to preserve them from the bad effects of cold damps.

Of the fattening of Turkies.

It is only when the cold comes on, and when *young turkies* are about six months old, that one must think of giving them better and more plentiful food, in order to increase their size and plumpness expeditiously. The males are then known by the name of *turkey-cock*, and the females by that of *turkey-hen*.

To fatten them, their appetite must be well supplied, and the common diet will do; but if they have not one sufficiently keen, they must be stuffed, kept in a dry, dark, airy place, or better let go about the out-houses, but without stirring out of the farm-yard. The following may be given to them for a month, every morning: boiled potatoes mashed, and mixed with the meal of buck-wheat, maize, barley, beans, according to local resources, made into a paste, and of which they may eat as much as they can. Every evening the remains of the paste must be carefully removed, and the vessel thoroughly cleaned in which it had been put in the morning.

As with others, the victuals of this bird must be kept clean, and the utmost care taken not to give them on the morrow the remains of the paste of the preceding day; because, if the weather is warm, it contracts a sourness which might displease them. A month after this food has been continued, there must be added to it

every evening when they go to rest, half a dozen balls of barley meal, which they are made to swallow, and that only during eight days; at the end of which the *turkies* will be exceedingly plump, delicious, and weigh from twenty to twenty-five pounds.

In many parts, people do not take the trouble to bring up *turkies*, they buy them lean at market, when they have got the red; and they are fattened insensibly, by giving them every residue that can be disposed of. Females are easier fattened than males.

Another custom is in practice to fatten *turkies*; it consists in making them swallow balls made of nut-shells and potatoes, which they digest uncommonly well. A small number is given them first, and which is increased as they go on. The first thing to be done is to coop them up in a dark place, and make them eat forcibly, by stuffing in their throat all aliments that may agree with them.

Every district has its mode of fattening *turkies*, and every where it depends on local resources; at one time, it is the acorn, the beach-mast, and the chesnut, boiled, and mixed with any sort of meal whatever, the most common grain; at another time, as in Provence, whole nuts are given to them, and which they are made to swallow one by one, by sliding the hand down the neck till they feel it has passed the gullet. They begin by one nut, and go insensibly on to as many as 40; but many persons do not like this mode of fattening, on account of the oily, rank taste it gives to the flesh.

It has been asserted also, that it would be possible to fatten *turkies* faster, and with less expence, by caponing them; and that besides, it would produce better and sweeter flesh. We are at a loss to know whether this operation is any where in practice; but, allowing it to be so, it must be attended by numerous accidents.

It is well known, that before the shooting of the red, that is, before they come to be six months old, the chickens are so delicate that the least injury they receive is mortal: how then could they support the most painful operation that nature can bear? It is not known whether it would succeed, when the abovementioned time is passed. Experience must solve this problem. Several intelligent wives should make it their business.

We shall observe, until these results are made known, that a housewife, well skilled in the art of caponing fowls, has attempted it several times without success; that this

bird is very large; that the fingers cannot come at the testicles unless a large opening is made, and in consequence a great wound. Naturally gluttonous, they fatten easily upon any food whatever, given in abundance, without it being necessary to have recourse to an operation, easily performed on the fowl, but which cannot be executed without danger on the *turkey*.

Enemies of the Turkey.

Vetch, marrow-fat peas, fitch, are poison to *turkey-chickens*; and if with their paste a superabundance of lettuce is mixed up, an immoderate use of this plant loosens their body. Now, supposing them to be at all loose, they are done for; nothing can save them from death. People should make it their business to give them aromatic herbs in preference, better calculated to warm than cool them.

There exists also in the fields some plants injurious to the health of *turkies*, and which, as with ducks and geese, are real poison; these are the henbane, the large blue-flowered fox-glove, hemlock; these plants should be pointed out to the leaders of the flocks, to have them rooted out in every place where it is customary to lead them to feed.

Wild animals eat fowls, and magpies are passionately fond of their eggs. In a woody neighbourhood, the large weazel, polecat, and other animals of this sort, are to be feared; snails, slugs, and grasshoppers, must also be guarded against; the latter of which, *turkies* are very greedy of: it appears that when they eat their fill of these, they cause a looseness of which they die.

Rain is the greatest enemy to *turkey-chickens*; if they are caught in it they must be wiped one after the other, and hot wine streamed over their back and wings. The hot sun, fogs, are the cause of other accidents, which we are going to treat of.

Diseases of the Turkey.

It has been said, but upon no foundation, that the constitutions of *turkies* differed not in the least from the common fowl; that their diseases were of the same kind, and that the same remedies should be applied for their cure. There can be no doubt, that when they are looked after in a suitable manner, sufficiently fed, and

lodged in wholesome and airy habitations, these birds can be preserved from many accidents to which they are subject. It must not, however, be concealed, that although of the family of the fowl, that they are exposed to peculiar affections.

In the first instance, the *turkey-chickens* are infinitely more difficult to be reared than young fowls; and before they come to that age when they can dispense with mothers' care, they cannot escape a turn which to them is a critical moment; this is what is termed the *shoot-ing of the red*. Their sanguine constitution exposes them equally to accidents unknown to the common fowl. In fact, when their nipples swell and look red, if the weather is changeable, many of them fall victims; but none perish when the season is favourable, and care has been taken to strengthen them with the crumbs of bread soaked in wine, or a paste mixed up with pepper, fennel, parsley, or hemp-seed. It might again be possible, by means of letting blood in the axillar vein, under the right or left wing, to succeed in saving them.

In their younger days it is remarked, that they are subject to a disease, which shews itself by very strong symptoms of weakness: they soon perish if care is not bestowed on them. The tips of the feathers of the wings and tail of black *turkies* become white; the plumage bristles up all over the body; they have a languishing aspect, and housewives then call them *heated turkies*. On examining attentively the feathers on the rump, two or three will be found whose quill part is filled with blood. The extraction of these soon restores the animal to health and strength. They are sometimes costive, at other times, on the contrary, they have a looseness; to these two opposite diseases only a single remedy is applied, that of warming them.

When the chicks are ill, they look dull and hang their wings; they must be taken from the female and put near the fire, and their feet wrapped up in a little hemp, lest they peck at them; they are made to swallow some pepper-corns, food is laid before them several times in the day, and they are not to be returned to their mother before they are quite strong again.

At a more advanced age, a swelling takes place on their head, which is cured by facilitating the discharge at the nostrils, and by rubbing them with fresh butter; sometimes the blood is impelled towards the head, which

is covered with pimples; these must be fomented with a decoction, of which vinegar is the basis; onions and pepper must be added, and they must be made to eat hemp-seed, to favour the discharge: they sometimes die of this disease. To avoid the total loss of the animal, the head is cut off, and the rest is good to eat.

When arrived at the maximum of their growth, *turkies* are exposed to another disease, infinitely more dangerous; several economists have compared it to the rot in sheep, while others have not doubted but that it was the small pox; but well skilled observers have remarked, that it had not absolutely any of the distinctive characters belonging to these two contagious eruptions, only for these birds; for it is false that it is so for sheep; and, *vice versa*.

This disease shews itself by pustules, which come out either on the surrounding part, or inside the bill, and as far as the throat, or on those parts the most destitute of feathers, such as the internal parts of the wings and thighs, or on the nipples; it is commonly mortal; therefore farmers are in the habit of killing their turkies, when they have ascertained that they have got it: there exist, however, means to cure it.

The first step to be taken in this case is, the moment that this disease is perceived to be among the *turkies*, to separate them from those that are sound, both to prevent them from catching it, and to favour the administration of diet, or the application of the remedy, or to burn these pustules with a hot iron; and if they are on the inside, they are bathed with vinegar, in which a small quantity of vitriol has been put: in short, wine must be given them both as a tonic and cordial.

Here is a fact, which proves that it is possible to bring to life those young *turkies* whom cold has seized at a distance from their mother. A chick, about five or six days old, was found in the morning, laying on the ground in the coop, bereft of feeling and heat; the turkey-keeper threw him on the dunghill in the poultry-yard, where it became the prey of the poultry: some children got hold of it, and were disputing who should have it; and it had already passed through several hands, before he was able to seize it; he laid it on a bed of warm ashes, covered over with a cloth; and hardly had it remained three minutes in this position, when it gave some signs of life; he then made it swallow a drop of hot wine,

and he laid it in a basket filled with feathers, in which he took care to keep up the prescribed degree of warmth: at the end of four or five hours the bird began to eat, and on the third day he was enabled to follow the flock, and became the finest of one hundred and twenty *turkies*. This cure has saved the lives of many young *turkies*, whom accidents of the like nature, and frequent storms, had reduced to the last gasp.

Of the economical Uses of the Turkey.

We have seen, in these latter times, luxury raise its voice in favour of those *turkies* with a white coat, on account of the feathers which it borrowed from them, to supply the deficiency of those furnished by the ostrich. It would now perhaps be the time to have recourse to this supplement, more especially at this moment, when the use of plumes consume such an enormous quantity of these materials, which commerce can with difficulty procure. These feathers are found on the lateral parts of the thighs.

Although the eggs of *turkies* are but little used in the kitchen, because these females hardly ever lay more than they are able to set over; those of the second lay being rarely set aside for the reproduction of the species, form the chief food of *turkey* chickens in their first age, or when, being stronger, they have been seized by the cold. They are eat in the shell, and they make a part of most of our dishes: they are ever preferred to those of the fowl for pastry, and their mixture with the latter render omelets more delicate. It is well known, that the dung of *turkies*, when properly employed on a strong soil, and for certain productions, makes excellent manure; but it is particularly for its flesh that this bird is sought after, and that of the female is reckoned to be the most tender and delicate, therefore she is chosen in preference for fattening: among young *turkies*, on the contrary, it is the male; but it is useless to gorge them with food to increase their plumpness, because they may be considered as the young fowl, which they even surpass in point of flavour and delicacy. When *turkies* are killed, and in general all poultry, their bowels, as soon as they have expired, must be taken out; for the animal being cooled, the extraction becomes more difficult, and this neglect makes it contract a disagreeable smell and taste.

Turkies are stuffed with truffles, whose perfume they easily take; they are often filled with balls made of hashed meat or roasted chesnuts.

Turkey-cocks or *hens* seldom make a part of a mess of soup; they may nevertheless serve for this purpose, when when being old, they are falling off, and that it is impossible to make a roast of them, or to eat them boiled with sauce; when taken out of the pot, care must be taken to throw in some salt, and serve it up with a little broth: of all boiled fowls none is so wholesome as this.

In short, in order to make the utmost profit of these useful birds, they must be killed when pigs are to be killed, and put in quarters in earthen pots, like ducks and geese, with sufficient fat to cover them, that of pork is used; so that by these means, one may eat *turkey* all the year round, as we do fat ducks: make soup of it in the country, and have constantly a regular ordinary. It is infinitely better to consume *turkies* in this manner, than to have them always roasted: add to which, that one alone produces an uncommon quantity of flesh, which, for whiteness and flavour, is preferable to that of other birds, which are equally submitted to the process of fattening. (P.A.R.M.)

The following curious method of rearing these *turkies* to advantage, is translated from a Swedish book, entitled, *Rural Economy*.

“Many of our ingenious housewives,” says this ingenious author, “have long despaired of success in rearing *turkies*, and complained that the profit rarely indemnifies them for their trouble and loss of time; whereas,” continues he, “little more is to be done than plunge the chick into a vessel of cold water, the very hour, if possible, but at least the very day it is hatched, forcing it to swallow one whole pepper-corn, after which let it be returned to its mother; from that time it will become hardy, and fear the cold no more than a hen’s chick. But it must be remembered, that this useful species of fowls are also subject to one particular disorder, while they are young, which often carries them off in a few days. When they begin to droop, examine carefully the feathers on their rump, and you will find two or three whose quill-part is filled with blood: upon drawing these, the chick recovers, and after that requires no other care than is commonly bestowed on poultry that range the farm-yard. The truth of this assertion is too well known

to be denied ; and as a convincing proof of the success, it will be sufficient to mention, that three parishes in Sweden have, for many years, used this method, and gained several hundred pounds by rearing and selling *turkies*.

THE GOOSE.

GOOSE, (*Anas anser*, Lath, fig. col. pl. of *Buffon*, No. 985,) a bird, classed by Latham, among the genus of Ducks, palmipedous order. To every one else but to these *methodists*, geese are perfectly distinct from *ducks*, and there is no one who does not know them by very striking differences of conformation. Their semi-cylindrical bill, rather obtuse, gibbous at the base, as thick as it is broad, covered with an epidermis, and denticulated like a file ; the upper mandible convex and the under flattened ; the tip obtuse, and curved downwards. The bodies of *geese* are usually larger than those of *ducks*, and their legs are not placed so far behind.

In the species of the *goose*, properly so called, nature knows but one race. The industry of man has created another, larger, and whose shapes, colours, as well as nature, have undergone those modifications which are to be observed in all animals that have for a long time been domesticated. See the *Article of the TAME GOOSE*.

The colours of the *wild-goose* are unchangeable ; the feathers that cover the body are of an ash coloured brown, with a lighter edge ; the bottom of the belly is snow-white ; the rest of the lower parts are whitish. The sixteen intermediate quill feathers of the tail are blackish, edged outwardly, and terminating in white ; the outermost, on each side, is entirely white. The upper mandible is blackish, the other is of a saffron colour, with the tip black ; the irides are reddish ; the feet, which are more slender and thinner than those of the tame duck, are of a yellow-orange hue ; the claws are blackish.

In our climates, the *wild-duck* is a bird of passage, and the messenger of cold weather. It is to be seen coming from the northern countries in the beginning of winter, in flocks, more or less numerous. Every one is acquainted with the order that these birds observe in their migrations ; they place themselves in two lines, forming an angle, somewhat like a V ; if the flock is not many in number, then there is but one line ; but in both cases the order is exactly observed by each traveller ; and when

he that soars foremost of the angle, or in front of the line, is tired, he, to rest himself, falls back to the last rank. *Geese* almost always fly high; and it is on foggy days only that they come near to the earth. Their flying is light and easy; they make no noise, and it is by their cries only that they usher in their passage.

"The natural cry of the *goose*," very truly says the historian of nature, "is a very clamorous voice; it is the sound of a trumpet, or clarion, *clangor*, which it utters very frequently, and which is heard at a great distance; but it has besides other brief accents, which it often repeats: and when it is attacked or scared, it, with its neck lengthened, its bill wide open, puts forth a whistling, which may be compared to that of the snake; the Latins have endeavoured to express this sound by imitative words: *strepit, gratitat, stridet*."

Now, it is not the glottis that produces the sound of voice in *geese* and *ducks*, but membranes, placed at the bottom of the wind-pipe. The membranes are disposed two by two, and have the effect of two reeds of a haut-boy, situated along-side each other, at the two bony and oblong openings of the internal larynx, which let in the two first branches. The anatomical description of the organ of voice in the birds we are now busied with, may be seen in the *Supplement à l'Encyclopédie*, Tom. 3, in fol. article LARYNX. The effect of this peculiar structure is easily come at, if, after cutting off the head of a *goose*, and taking away the larynx, you press the belly, for then the same voice is produced as when it was living, and had a larynx. There is still another effect of this structure: it is the nasal sound of voice of *geese* and *ducks*, which the ancients named *gingrisme*, and which is imitated in the trumhorns of organs, by adjusting the reed-stop to the pipe, in the same manner as they exist in the wind-pipe of these birds.

The stay of *wild-ducks* usually lasts two months, unless the winter be mild. When the cold sets in sharp, they fall back to more southern countries: but they all repass in the month of March, by different tracts, to the several northern countries of our continent, where they breed. They proceed onwards to the highest latitudes, Greenland, Spitzbergen, the borders of the frozen ocean, &c. but they do not go on to North America. They commonly lay sixteen eggs.

These birds cause great mischief in open and sown

plains, by plucking the ears of the corn, and even by rooting it up, if the earth is moist. In those districts, where they make a practice to alight, agriculturists are obliged to watch their corn, and keep off the geese by cries. In the evening they resort to rivers and ponds, where they pass the night, and denote their meeting together by very loud and repeated clamours. They do not leave the water till it is broad day; the reverse of ducks, who only feed at night, and alight on rivers, ponds, and fountains, in the day time. Such an opposition in the habits of *geese* and *ducks* should alone have been sufficient not to confound these birds in one and the same genus, had not systematic authors, in order to point out methodical distributions, agreed, as it were, only to notice some exterior features, and to neglect what concerns the nature of the animal.

Whether *geese* feed in the open fields, or whether they repose on the water, they are very difficult to come near, and still more so to catch. Their vigilance, perfectly well seconded by a good eye-sight and a nice ear, are never at a loss. They are not seen to eat or sleep all at a time. There is always one of the flock with its neck stretched out, head cocked up, to examine and to listen; on the appearance of danger, this attentive centinel gives the signal, and the whole flock flies away, rising upward in the air at first, in order to be soon out of the reach of danger. These, surely, are not marks of stupidity; and if to these are added those signs of intelligence and attachment which may be remarked in the race of tame *geese*, one will soon be convinced of the little propriety of this vulgar expression or comparison: *stupid as a goose*.

Chase of the Goose.

Although *wild-geese* are rarely fat, and oftentimes tough, they are, however, sought after by some. But in this difficult chase sportsmen stand in need of all their craft; and they rarely succeed in baffling the shyness of these birds. The principal stratagems in use consist in putting on, in snowy weather, a white shirt, so as not to be perceived, or to cover oneself over with leaves and foliage, or with the skin of a cow, to look like a walking bush, or a cow a grazing.

When the frosts keep the fields dry, a proper place is looked out for laying a long net, secured and stretched by

cords, so as to be quick and easy in falling, something like the net for larks, but covering a longer space, which is covered over with dust; some tame geese are then placed on it by way of decoyers. It is absolutely necessary that these preparatives be made in the evening, and that no one should afterwards go near the net; for if in the morning these birds saw the hoar frost brushed away, they would be shy. They come then at the call of these decoyers, the bird-catcher being hid in a pit at fifty paces distant, draws the cord of the net in time, and catches the whole troop, or at least a part, under it. It is almost impossible to shoot geese in the evening, on their arrival on rivers and ponds, or to surprise them in the morning at their departure; but it may be done by conducting a boat to those places which geese are in the habit of frequenting: it is secured in the middle of the water, and there left for three or four days, in order that the geese may be used to the sight of it: at the end of that time the sportsman gets into the boat, before dark, and there remains on the watch, having a large barrelled gun with him.

The artificial cow is also resorted to, in order to come near *wild-ducks*.

In whatever manner they are shot at, the shot with which the piece is loaded must be as large again as the shot for hares, because one is always obliged to shoot at a distance: their plumage is besides very plentiful and close.

The tame Goose. This bird, famous for the services it rendered the Romans, by warning them of the enemy's approach under the walls of the Capitol, is, of all those brought up in farms, that which lives the longest: but as he sympathizes in some degree with the *duck*, and as he loves better to pasture than to dabble, it does not appear to us to be indispensably necessary, that the place where it is intended to bring some up, should be very moist, provided that there be some neighbouring meadows, and that care be taken to keep the *goose* away from the rest of the poultry, this will be sufficient.

In fact, confined as a prisoner in the poultry-yard, the *goose* could not live in common with the *fowl* and the *turkey*; it ill-treats them, and destroys every thing that comes in its way. Now, being naturally a destroyer of vineyards, gardens, orchards, and fields that are sown, they also must not be suffered neither to have access to

these, as well as all other places where there are young trees, and consequently nurseries.

Notwithstanding these inconveniencies, which it is an easy matter to prevent, by running a quill through the openings geese have on the upper part of the bill, by muzzling them much in the same manner as pigs, and by putting sticks, as on the necks of dogs, to hinder them from ploughing up the ground, from overrunning and getting into the plantations, it must not be concealed, that the farmer's wife, who has at her disposal pasture-land on which these birds delight, and find a great part of their food, that it would increase her income, without the rest of her poultry-yard suffering by it; for with geese, nothing is lost; the quill feathers of the wings, and the down, their eggs, their dung even, their flesh, their fat, are an ample compensation for the care they require in their first days, and the expence they incur when they are fattening.

In Lower Languedoc, the least farmer rears geese, but he only keeps two or three females, and no gander ('tis thus the male goose is called) on account of the food they take, and of their being so mischievous, which even renders them dangerous to children. In the spring, for a trifle, he leads the female to the male, which has been kept in the larger farms; but they will only couple in the water; and it is diverting enough to see all the little artifices put in practice by housewives to obtain, for their goose the attention of the male, who swims for a long time round the female, before he accedes to her desires.

Choice of a Male and Female.

In order to have a good race of geese, the gander must be chosen of a large size, of a fine white, with a lively eye; the female either brown, ash, or party-coloured: those with a broad foot, are preferred: the colour of the plumage ought also to determine the colour of these birds. The party-coloured are preferred to the grey ones, because the feathers sell much dearer; but the latter are reckoned to be more fruitful, and to give the finest goslings; however, party-coloured ones must be also had, because they are more attached and steady to their home.

It is in Upper Languedoc, especially, that geese breed well, and are as large as swans. Their distinctive mark is having under the belly a lump of fat, which hangs on

the ground the moment these birds walk. This fat, however, is not very prominent till the month of October; it increases as the bird gets plump: it is called in the language of the country *panouille*. Proceeding from Toulouse up towards Pau and Bayonne, this lump diminishes; the species becomes more feeble and inferior; but in return they are better and more delicate when potted, which must be owing also to the quality of the salt that is used, and which comes from the salt fountains of Sallies, in Bearn. This salt is white, quite pure, does not draw the dampness of the air, nor contain any muriatic, calcareous, or magnesian salts, of which a great quantity abounds in the salt that comes from the shores of the Mediterranean, which are not left long enough exposed to the air and rain. 'Tis this white salt of Sallies which contributes to the goodness of those hams, called Bayonne hams, brought to us from the Upper and Lower Pyrenees.

Two species of the *tame-goose* are known, the large and the small, which is a variety of it; but the former is almost always reared, as it is more profitable, especially the white ones; for those whose plumage changes colour are generally reckoned to be of a bad race; but it would be possible to find among the wild species, *ganders* which could couple with our tame *geese*, whence would result a sort of mixed breed, whose flesh would perhaps be more delicate than that of the common *goose*. It appears that in Spain, where the rivers and lakes are every where covered with *wild ducks* and *geese*, that these crossings have been attended with great success.

Every work on rural economy affirms, that one *gander* is enough for six females; but the experience of those possessed of a male to serve for a stallion, has taught them that he can serve many more without fatiguing himself: we are in want of a desideratum on this subject. M. St. Genis has ascertained, that *geese* will pair like *pigeons* and *partridges*: he has even remarked, that when the number of males exceeded that of the females by two, and even by three, including the common father, no disturbance has taken place between the males; the couplings were made without noise; and most likely by respective choices. There remained, besides the old one, two males, which were not provided for. The couples kept continually together, save some momentary separations, during which the other males, and even the two single ones, did not offer to approach the female to

which it was not coupled. The two *ganders* went always together, which might make one presume, that one of them should be a female, although they were both white. But Saint Genis has moreover ascertained that they were males; and has made it plainly appear by this, that in general the males are white; whereas their mates have always got some grey feathers. This distinction, believed to be certain, has been made by no naturalist; it would be in vain to look in their works for the characteristic signs of *male geese* and *female geese*. There are, towards Toulouse, many party-coloured males; they have some feathers on their head which bristle up when they are angry, and look like a small tuft.

Habitation of Geese.

The neighbourhood of rivers and ponds is not absolutely necessary to the more successful rearing of *geese*: in those cantons destitute of this advantage, it will be sufficient to dig a small reservoir for them, where these birds can swim about, cool themselves, and dive.

In those places that are not damp, roofs are put up, by forming partitions; there never must be more than eight under one roof; the large ones generally beat the smaller; they should of course be separated one from the other, by hurdles, or otherwise: *geese* are put by twenty or thirty in the same stable.

Geese, at all times, like very much to have a clean, dry place to sleep in; therefore the housewives' girl, who often renews their litter, will succeed in preserving them from all sorts of vermin, which torment, and hinder them from gathering strength.

On the Laying of Geese.

The fruitfulness of *geese* is extreme; when well fed, they can make as much as three lays a year, each composed of twelve eggs; and if one is careful in taking them away as fast as she deposits them, and that the laying suffers no interruption, they lay as many as forty and fifty, which produces considerable profit; for in the environs of Toulouse they sell from three to four *sols* a piece for setting.

An essential precaution to put in practice is, as soon as it is perceived that the *geese* want to lay, to coop them up under their roof, where nests, made of straw,

have been prepared ; as soon as the first egg is laid, they continue to lay successively in the same place.

It is best to hasten the laying of *geese*, in order to have early *goslings*, and that they may be strong when the time comes for selling them, and that they may be come to the utmost of their size in the season for fattening and potting them : this may be brought about by forcing the food, and by keeping them in a warm, clean place.

The moment for laying is apprehended to be at hand when the *goose* carries straw in her bill to make a nest ; short dry straws must then be increased near the spot she had fixed on ; and if this place be at all inconvenient, one must endeavour to divert her from her first choice, by laying straw in the spot intended for her, and especially nettles, the smell of which she is fond of : she will go there and lay her eggs, if attention is paid in placing food near her ; as also a large vessel of water, in which she can wash herself and drink.

Setting.

When it is remarked, after each laying, that the *goose* begins to keep her nest longer than usual, it is a proof, as with every other female of domestic birds, that she is not far from setting. It has been said that she knows her own eggs again, that she rarely submits to set over others given to her, and that she often gives them all up ; but these assertions are as yet unsupported by any positive fact.

The nest that is made for them is nothing more than a bed of straw, in a circular shape, which is lined with hay. Fifteen or twenty eggs may be put under each female, which is sufficient even for the largest ones ; but it is very wrong to take them off their nest to make them drink : the like being done in some farms, they return to it without the least constraint, and, on coming near, set up joyful cries, which shew how much they are attached to their brood.

Incubation lasts two months. The common food is barley mixed up with water, which is placed by the side of the nest, in order that the setter may quit it as little as possible. If she were once forgotten, it would be enough to expose the eggs to get cold, or the mother to take a dislike to her labour. The *goose*, like other females, eats little when setting ; but it is proper that she should have near her food and water, in which some farm-

ers' wives have continued to mix a little vinegar; and that the nests be so arranged that the eggs cannot fall when the setters turn them. The males do not go much from them, they seem to watch them, and to be very anxious to see the young ones, that are to be born, make their appearance.

An economical way of getting many goslings is by employing *turkey-hens* to set; the common fowl has been equally praised for filling this important function; but *geese's* eggs being very large, and their shell very hard, she is not bulky enough to hatch more than eight or nine; The *turkey-hen*, therefore, deserves to be preferred to her, because she can hatch fourteen or fifteen. This function of the *goose* being thus filled by another, she is not drawn off from laying, and yields eggs in great abundance.

In the environs of Toulouse, where many *mallard geese* are reared, out of the *common duck* and the large *India duck*, they have a care to give their eggs to the common fowl to hatch; and to these are added two or three of the large sized *goose's* eggs; the bird resulting from this, conducts the young *geese* in a superior manner and walks always at their head.

Of Young Geese or Goslings.

Goslings, in a like manner with *turkey chickens*, are a month in hatching; they are taken from under the mother, because, feeling the young ones under her, it would be running the risk of seeing her often leave the rest of the tardy brood. After having separated them, they are often kept in flat wicker pens, or compartments, covered with a cloth, and lined with wool; and when the whole brood is come forth, the first hatched are returned to the mother.

In Lincolnshire, it appears, from the opinion of John Foote, that when *geese's* eggs are on the point of being hatched, to be the custom to break the shell a little, to give air to the gosling, and to help its coming out. Perhaps this practice, though dangerous to *chickens* and *turkey chickens*, is less so to the *goose's* egg, whose shell is commonly very hard.

On the first day after the birth of the *goslings*, they may be let out, if the weather is warm, but having care not to expose them to the intense heat of the sun, which would

kill them. Food is given to them, prepared with some barley coarsely ground, bran, and raspings of bread, which are still better, soaked and boiled in milk, or curdled milk, melilot, lettuce leaves, and crusts of bread boiled in milk.

After that time, the housewife takes advantage of a fine warm sun to turn them out for a few hours; but being aware that cold and rain are very hurtful to them, she keeps them cooped up; and also has a care to prevent them from mixing with the large ones, unless they have strength enough to defend themselves against any hostile attack to which new comers are exposed; she is, moreover, in the habit of giving bran to those *goslings* that are a little strong, twice a day, morning and evening, and to continue to give them the same, till the wings begin to cross on the back, then herbage, which they are particularly fond of, may be mixed with it, such as lettuce, beetroot, &c.

Of the Food for Geese.

With a view of satisfying their voracious hunger, succory leaves and lettuce chopped up are given to the *geese*; all sorts of vegetables boiled and mixed up with bran in warm water, agree with them very well; they are led with *turkies* to pasture, or in the fields after the harvest; they are left to dabble in the water as long as they please.

If one was always obliged to feed *geese* in the poultry yard, they would be found to cost more than they would fetch. Therefore as soon as the *goslings* are about two months old, they must join the male and the female, which have been kept for laying, to determine them to go of themselves in flocks to the meadow, and to the sides of ponds, to remain there all day, to return home in the evening without the assistance of any body whatever; the expense of a leader is by this means spared: an example once set, perpetuates itself without further trouble. *Geese*, however, being rambler, it might happen that a too great security in regard to them might injure the farmer very much. Those birds of passage which arrive in flights to live among us during the winter, and which are easily tamed, alight near the tame ducks in meadows; now, as the latter might take a fancy to regain their liberty, the housewife must be cautious to pluck some feathers from their wings, and to break even an end, then they

never quit their abode; oftentimes they bring in *wild geese* which they have decoyed.

Before we point out the different modes of fattening *geese*, we shall premise that the old ones do not get fat so easily as the young ones, and that the earliest *goslings* should be sold, because the time for fattening being as yet at a distance, it would be too expensive to wait for that period: but if among the number there be any which are accustomed to cry, they must be separated; for the least noise torments them, and they would be longer than it is wanted, in coming to a proper size and plumpness.

It has been asserted that those *goslings* coming from old mothers, improve infinitely more than those of young *geese*; but they answer just as well, provided they come from a first brood; it has even been remarked that they were more fruitful.

Of the Fattening of Geese.

It is the same with the *goose* as with every other bird that is fattened up; that moment must be laid hold of, when being come to a complete plumpness, they would soon get lean and would die, if they were not killed. It has been calculated that upwards of forty or fifty pounds of maize were requisite in those parts where this grain is in abundance: it is replaced in other parts by barley. They are also fattened with grain, which is called in Languedoc *sarde*, which is covered with two or three shells. It takes about three weeks to bring this bird to that degree of plumpness which it is capable of attaining.

Geese are fattened at two different periods of their life, or when they have come to the common size. In the first case, it is a matter of a fortnight or three weeks at the farthest; in the second, a month, more or less, is requisite. The whole business consists in plucking the feathers from underneath the belly, in giving them food in plenty and drink sufficient; in cooping them up in a dark, cool, quiet, and not roomy place; and above all it should be so managed, that they may not hear the cries of those left at liberty for the propagation of the species, and in not letting them out but to be killed.

It is in the month of November, and when the cold sets in, that one must think of fattening *geese*; by waiting longer, they would be nourished to no purpose at all; they would get to rut, set about laying, and the operation

then would not answer so well. To manage this, several modes are in practice: we shall describe them all. This bird is of a too advantageous resource, in our southern and western provinces, to omit, on this point, the least particular. Mr. Puymartin has assured me, that in the single town of Toulouse, from July to October, one hundred and twenty thousand of them were consumed, which are mostly sold in quarters. The *goslings* sold in this manner are young and not fattened; they cost 50 *sous* and 3 *livres*, they yield four quarters, without the giblets, so that the dinner and the soup of the labourer do not cost him more than 12 *sous*.

First Mode.

Where there are but a few *geese* to fatten, they are put in a cask, in which holes have been bored, through which they thrust their head to take their food; but as this bird is voracious, and as with it hunger is stronger than the love of liberty, it easily fattens, provided they are abundantly supplied with wherewithal to swallow. It is usually a paste made of barley-meal, Indian corn, or buck-wheat, with milk and boiled potatoes.

The process in use among the Poles to fatten *geese* expeditiously is nearly the same; it consists in putting the *gosling* in an earthen pot with no bottom, and of such a size, that it will not allow the animal to move one way or the other. The paste just alluded to is given him, as much as he can eat. The pot is so placed in the cage, that his excrements do not remain in it. Hardly have *geese* remained a fortnight in such a prison, when they get to such a size, that the pot is obliged to be broken to get them out.

Second Mode.

As soon as *geese* can no longer find any thing to glean among the stubbles, and have picked up the grain left on the threshing floor, they are cooped up, twelve by twelve, in narrow pens, low enough to prevent them from standing upright, or being much in motion; they are kept clean, by often renewing the litter. Some feathers are plucked from each under the wings, and about the rump. All the Indian corn (having been previously boiled) they are capable of consuming is put into a trough, and plenty of water in a porringer. For the

first days they eat a great deal and at every moment; but their appetite diminishes towards the end of three weeks; and as soon as it is perceived that it begins to fail them in earnest, they are blowed, or they are stuffed twice a day at first, and then three times. For this purpose grain is introduced into the crop of the animal with the help of an instrument; it is a tin funnel, whose pipe, five inches and a half in length, and ten lines in diameter in the whole length of it, the end of which is shaped like the mouth of a flute, and rounded, forming a small ledge, soldered, and placed to prevent any hurtful scratching to the animal; to this pipe is adjusted a small round bag, through which the grain is poured down. The housewife, sitting squat on the ground, after having put the pipe into the neck of the goose, which she holds with one hand, with the other she takes grain which is at hand, lets it fall softly, and thrusts it down as fast as it is wanted, so that none remain in the funnel; she puts, at intervals, under the bill of the animal, a porringer of fresh water.

In Alsace, it is recommended to put in the bottom of the porringer a handful of fine gravel, and a little pulverised coal; persuaded that this drink contributes to fatten the goose faster, to facilitate the passage of the maize, and to increase the size of the liver. Others point out the skimmings of the pot; and when she perceives that the crop is nearly full, she leaves that one to take another in hand.

This operation, although practicable by any body, is, however, too delicate to be left to any but clever hands. Water must be kept in the coop, for a superabundant and forced food makes them very dry, and would suffocate them without this caution. Ten geese will thus occupy a woman for an hour, morning and evening; they may be crammed three times a day, if they digest with ease; but it would be dangerous to begin again, as long as their digestion is not completed. In less than a month the geese will get prodigious fat, and acquire double their weight, that is, from eighteen to twenty pounds.

Third Mode.

The object of this is to increase the size of the liver. Every one is acquainted with the endeavours of sensuality, to cause all the vital forces to flow to this part of

the animal, by giving it a sort of hepatical cachexy. In Alsace, a person buys a lean *goose*, which he confines in a little pen made of fir, narrow enough to prevent it from turning about: this cell is supplied, in the back part of the bottom, with small sticks at distances, for the passage of dung, and in the front, with an opening for the head; below is a small trough, always full of water, in which some bits of charcoal are left to steep. A bushel of maize is sufficient for its nourishment during a month, at the end of which the *goose* is found to be sufficiently fattened: some is put to soak in water the day before, a thirtieth part which is inserted in their throat in the morning, and then in the evening: the rest of the time they drink and dabble.

Towards the twenty-second day, some spoonsfull of oil of poppies are mixed with the maize. At the end of the month, information is given by the appearance of a lump of fat under each wing, or rather by difficulty in breathing, that it is time to kill them; if this were deferred, it would be choaked with fat. He then finds the liver weigh from one to two pounds; and the creature is found still the more excellent eating, and while dressing, yields from three to five pounds of fat, which serves to relish one's vegetables the remainder of the year.

Out of six *geese*, there are commonly but four (and these are the youngest) which answer the expectation of the fattener; he usually keeps them in a cellar, or in a place rather dark. The Romans, who were fond of these livers, had before observed that darkness was favourable to this kind of rearing, as without doubt it keeps every disturbance at a distance from them, and determines every faculty towards the digestive organs.

The want of motion, and the difficulty which supervenes in breathing, may be added to it; the first, by diminishing the wasting of animal spirits, and both by checking the circulation of the blood which must hydrogenate as fast as its carbon unites with the oxygen, which this liquid absorbs; this agrees with the formation of the oily juice which, after filling up the cellular substance of the habit, insinuates itself into the hepatical ducts, is there choaked up, to penetrate afterwards the very substance of the liver, and constitute that fat and luscious substance, which melting in the mouth of high livers, so deliciously tickles their palate. The liver then contracts but a con-

secutive choaking up, since the difficulty in breathing only shews itself at the last, by hindering the expansion of the diaphragm.

The leanness of *geese*, submitted to this diet, is often talked of: it could not take place but on those only whose claws had been nailed up, after their eyes had been put out, in consequence of the sufferings excited on the creature by such a barbarous mode. Out of a hundred fatteners, hardly two are now to be found who follow it; and even they do not put out the eyes but two or three days before killing them. Thus, the *geese* of Alsace, free from these cruel operations, get so prodigiously plump, that it might in the end be called a dropsical fatness, the consequence of a general relaxing of the fibres in the absorbing system, occasioned by a want of motion with a succulent and forced nourishment in a too disoxygenated atmosphere.

But we must not forget to mention it: the place where the fattening of *geese* is practised with the greatest success, is Lauragais, - in which maize is generally cultivated. M. Villele, placed between Toulouse and Carcassonne has, at different times, made some very interesting experiments, the result of which he has favoured me with, which serves to prove that the finest *geese* seldom weigh more than ten or twelve pounds, when they are only left to eat as much as they can, without cramming them afterwards; that if this operation is too hastily performed, and if a few pounds of grain are wanted to be saved, *geese* but half-fattened, and weighing but twelve or thirteen pounds, will then only be obtained; whereas those that are fully and perfectly well fattened, weigh as much as twenty pounds. Now, this overplus, consisting of fat, and this fat being worth 16 *sols* per pound, every goose completely fattened, is at least worth six *livres* more than those half fattened; and these six *livres* are worth three times more than forty *sols*: whence it follows, that where a few pounds of grain are spared in the fattening of *geese*, the profit got by it can never compensate that which is spared.

Salting of Geese.

In domestic economy the most simple processes are precisely those that should be preferred; and that it should be made a point to diffuse; for if they appear in

the least to require some care and complicate operations, they are rejected, even before they have been tried; the slowness with which the best practices are adopted in the country, is often owing to this cause.

Two methods are known for preserving *geese* in pots: the first consists in using them raw; in the second, they must be dressed: both have their partizans. The first is the most delicate, but the most expensive, because it then will be necessary to use some other fat to pour over.

To prepare them dressed, which is the way most in use, the quarters of *geese* are roasted brown in a copper stewpan, in which the fat melts; when the bones appear, and a straw can be thrust into the flesh, the *goose* is sufficiently done; the quarters are arranged in varnished earthen pots, at the bottom of which three or four vine leaves are laid, to prevent the quarters from touching the bottom, and that the fat may surround them on every side. Care must be taken to cut out those bones where the flesh is started; it is the first part of the salting that gets rancid and spoils the rest. Goose-fat is poured over it, so that when chilled all the flesh may be well covered, and preserved from the contact of the air; a fortnight afterwards pork-fat is poured over this, up to the brim of the pot, to fill up well those crevices which are made in the goose-fat; and the vessel is covered with a coarse oily paper, dipped in brandy: but notwithstanding these precautions, the uppermost quarters will contract a slight rank smell at the end of five or six months.

By this method the *goose* is potted raw: after having cut the meat in half quarters, or nearly so, a piece is taken and pressed in every direction against some very dry salt pounded like coarse sand, and it is placed in the pot with all the salt it has taken up; bit after bit is done in the same way, having care in placing them, to wedge them close in one against the other, and against the sides of the pot, so as to leave the least possible room. The pot is thus filled up till within four fingers breadth of the top, before any fat is put in; observé that it is not boiling; it is then poured in leisurely with a large wooden spoon: the pot is filled up with it. The first bits are commonly as fresh as those in the middle. We are indebted for these economical particulars to M. Paymartin, every one of whose establishments have an object of public utility.

Diseases of the Goose.

Cold and fogs are extremely against *geese*: therefore, when young, care should be taken not to let them out but in fine weather, when they can go to their food without a leader; when affected by a similar cause, a tonic drink is given; barley-meal, in this case, is a good remedy.

They are particularly subject to two diseases: the first is a diarrhœa; they are then made to take, with success, hot wine, in which the parings of quinces, acorns, or juniper berries, are boiled up. The second is like a giddiness, which makes them turn round for some time; they then fall down and die, if they are not relieved in time. The remedy is to bleed the bird with a pin or needle, by piercing a rather prominent vein, situated under the skin, which separates the claws.

A dreadful scourge to *goslings* are little insects, which get into their ears, and nostrils, which fatigue and exhaust them; they then walk with their wings hanging down, and shaking their head. The relief proposed by all agriculturists is to give the young, on their return from the fields, some barley at the bottom of a vessel full of clear water; in order to eat it, they are obliged to plunge their head in the water, which obliges the insects to fly and leave their prey.

Care must be taken to root out all the hemlock that may grow round about their habitation, and in those parts where the *geese* go to pasture. The *gosling* is very eager after it; but hardly has he swallowed a sprig when he stretches out his wings, goes into convulsions, and dies. Henbane is equally poison to him; and these plants are not so plentiful as to make it difficult in ridding the district of it for the safety of all the poultry.

Of Goose-feathers.

It has long been an opinion, that it was directly injuring the health of *geese* to pluck them. This operation, however, taking place before the moulting season, a disease, common to other birds, is followed by no inconvenience, more especially when done at the proper time, in a dexterous manner, and so as not to pluck from each wing but four or five feathers and the down.

As soon as *goslings* are two months old, they are plucked for the first time, and a second time, at the beginning of autumn, but with moderation, on account of the cold setting in, which might disorder them. Another precaution always to be taken is, that when the *goslings* are just plucked, not to suffer them to go into the water, but merely give them drink for a day or two, till the skin is closed. They are, lastly, plucked a third time, when after fattening them, they are killed. Thus, this bird, which has lived about nine months, can yield three crops of feathers.

It would then be gratuitously giving up a certain and considerable profit, which it is possible to clear in rearing a number of *geese*, if it were neglected to take advantage of having, two or three times a year, a crop of quills for writing, and of down for stuffing cushions and beds. It has been estimated, that this produce varied according to the age; and that a *mother-goose* commonly gives a pound of feathers; the young one gives half a pound.

Those *geese* intended to keep up the stock in the poultry-yard, and which are what is termed old *geese*, can, it is true, be plucked three times a year, from seven weeks to seven weeks, without inconvenience; but it should be deferred till the *goslings* are thirteen or fourteen weeks old, before they undergo this operation, especially those intended to be killed early, because they would get lean, and lose some of their good qualities.

The food has a great influence over the quality of the down, and the strength of the quills, as also the care that is taken of *geese*. Great precautions are requisite: the feathers always bring away with them a kind of fat, which would make them spoil, or would give them a disagreeable smell, if this inconvenience was not prevented, by putting them in the oven after the bread is taken out, and taking them afterwards in a dry, airy place. A *goose* can give ten feathers of different qualities, they are rubbed in warm ashes, or dipped in boiling water, and this is what is called *hollander* (*making Dutch quills*); but grease still remains on the surface; and it appears, that the process for making them clear, transparent, and shining, is not yet well known to us.

There is a kind of ripeness for the down, which is easily come at; it is when it begins to fall of itself; if it is plucked too soon, it will not keep, and maggots get to it.

Lean *geese* yield more than fat ones, and it is more in repute. Farmers should never suffer the feathers to be plucked from *geese* sometime after they have been dead, for selling. They generally smell strong and get lumpy. None but feathers coming from live *geese* or *geese* just killed, should be brought to market; in the last instance, they must be plucked speedily, the business should be over before the bird is entirely cold; the feathers are infinitely better for it. It is again a custom to turn their feet behind their back, so as to hold the wings, else the feet would break, and the *geese* would be no longer saleable.

Of the Economical Uses of Geese.

Before the discovery of the new world, *geese* were extremely common in France, and in the other parts of Europe; there seldom was a meal somewhat splendid, where this creature did not make an interesting appearance on our boards. It was the treat which Patelin the attorney offered to Guillaume. In England, a roast *goose* is eaten on Christmas day, in memory of Queen Elizabeth, who had one on her table the moment she received the news of the destruction of the famous armada of Philip II. king of Spain, who was to invade England and dethrone that queen. There formerly was at Paris a particular market that carried on the sale of *goslings*. Those who sold them were named *oyers*; but the acquisition of the *turkey* has superseded the *goose*, on account of its size being nearly equal, and of its flesh being much sweeter, and much more delicate. *Turkey-chickens*, to be sure, not so easy to rear as *goslings*, are not, as we have already said, unexposed to every event that threatens their existence till the red shoots; the *goose* is then, in this point, superior to the *turkey*, and even for the several products. Therefore in those parts, where the cultivation of maize is held in esteem, and where there are pastures, the *goose* is what it was a century ago, and it must be confessed that its flesh, down, feathers, fat and dung, are not to be disregarded in any place, where circumstances may favour the propagation.

But *geese* are not always bought with a view to fatten them. Men of great landed property in Beauce, are in the habit of buying *geese* at the moment it is harvest time, and to have them led over corn fields after the wheat-sheafs are taken away. There, they pick up all the corn that

would be lost without this kind of gleaning ; and it is a matter of about a month, till the plowing of autumn comes on ; although they are afterwards sold but for very little more than they cost, they however yield to the farm the profit of their feathers and their down, and on the fields where they have been, the manure of their excrement, and that which they leave in the sheds where they have passed the night, and which, whatever may be said to the contrary, is not, with some care, hurtful to fields and meadows.

The fecundity of the *goose* is well known ; she lays many eggs and of a large size ; they are not so good as the *hens*, and consequently are of little use in the kitchen ; but it has been remarked that they could be used in pastry with advantage, if they were not preferably used for setting.

Roast *goose* is delicious eating ; in Languedoc it is served at the best tables ; the poorest class, who consume the most, divide this bird in four quarters ; they make soup of one of these quarters as with beef, and afterwards the *goose* is roasted brown in the stewpan, with peas, beans, and potatoes, which affords a very plentiful and very nourishing dish ; but it must neither be too young nor too old : in the first case, the flesh is too slimy ; in the second, it is too tough and dry to be eat. So it is better to put it in the pot ; and served up with vegetables, is very profitable.

Many virtues have been attributed to *goose-fat*, applied outwardly. When divested by liquefaction over the fire of its albuminous particles, and of its superabundant moisture, it acquires a sort of consistence, the virtue of keeping for a certain time, and of serving in the dressing of meats, and even of preserving the thighs of the *goose*. With the Romans, it was reckoned an excellent thing. The skins and membranes that remain on the cullender, are equally put into pots, to make, in summer-time, soups for the farmers' men.

As for the rest, the flesh and fat of *geese* answer the same purposes as those of pigs, in most parts of France ; the labourer makes soup of it all the year round, and it serves the rich man to season the most dainty dishes on his table. The hearts of *geese*, broiled on the grid-iron, are excellent eating. The feet, parboiled and then fried, as also the tongues, deserve a place in the "*register of gluttons*."

Crammed *geese* yield very large livers, which sometimes

weigh as much as one pound and a half; they are of a pale white and very delicate; they do not, however, in point of flavour, come up to the livers of *ducks*. When kept for a certain time, they contract a reddish hue, which makes them to be rejected by cooks; but if the livers of *geese* are a good speculation for those who fatten them, the profit pastry-cooks make by them is still more considerable. There are at Strasbourg three or four at most, who are in that respect, in very great repute; they send these pies as far as Petersbourg, and transact yearly, for above fifty thousand crowns, in this line; these livers, full of fine and delicate fat, retain the perfume of those aromatics with which pies are seasoned, and among which the truffle of Perigord stands foremost.

The profit to be derived from goose-feathers, is not anywhere to be neglected; it is an important article of English commerce; in Lincolnshire they are sold at the rate of 21 liv. 10 sols per 14 pounds weight, and a *goose* can yield about 1 liv. 16 sous per year, either in down or quills.

Lastly, *geese* yield a dung, which may be reckoned among the most powerful manures. It is asserted, to be sure, that it is corrosive, and burned up the grass upon which the bird deposited it. It is possible that a too large quantity of this manure, immediately applied to meadows, may do them some mischief, as it happens with the manure of other poultry, which is equally used without proportion or modification. It is not then against the manure itself which one has a right to complain, but rather against the bad use that is made of it; it would therefore be necessary, in order to make it more useful, to have it previously dried and reduced to the state of a powder, or to have it mixed with other manures, that might keep under its too active powers. (*Parm.*)

The common *goose* is not the only species of the numerous family of *geese*. Several others exist whose history and enumeration we shall proceed to give.

ANTARCTIC GOOSE. (*L'Oie antarétique*). *Anas antarctica*, Lath. a figure of the female in *Mus. Carls. Fasc. 2. tab. 37.*) It has a great resemblance to the *goose* of the Falkland Isles. Navigators have given it equally the name of *bustard-goose*, and they have found it in Christmas Channel, along Terra del Fuego, and on those islands near the territories of the States. The male, rather smaller than our tame *goose*, is perfectly white, except the

feet, which are yellow, and the bill, which is black. The female, on the contrary is ash on the head, grey-brown on the neck, brown over the body, and black beneath; the primary quill-feathers of the wings are brown, and its bill is of a yellowish ash-colour.

SPUR-WINGED GOOSE. (L'Oie armée.) (*Anas Gambensis*, Lath. fig. col. pl. in Buffon, the male No. 982, and the female No. 983.) It is the size of the common goose, but taller; the forehead surmounted by a small black caruncle, and the wings, at the bend, have a long spur. In the male, the fore part of the head is whitish round the eyes; the rest of the head, and the top of the neck, rufous; beneath is a rufous band; the bottom of the neck and all the under parts of the body are striped crosswise with grey on a yellowish white ground. The mantle is rufous waved with dark purple; the tail and the primary quill-feathers of the wings are black; the second wing coverts fine white, and crossed by a narrow black band; the first coverts of a changeable golden-green; the turbécle, and the tip of the bill, black; lastly, the rest of the bill and the feet of a fine red. The female differs by the mantle, the secondary quills of the wings, and the orbits being of a dark chesnut; the green on the wings being less brilliant, and the hues of the other parts being more obscure. This species belongs to Africa.

BERING GOOSE. (L'Oie de Bering.) (*Anas Beringü* Lath.) This goose derives its name from the island where M. Steller saw it, in the neighbourhood of Kamschatka. Commodore Billings has also observed it at the Isles of Esdokiff. It is the size of the common goose. Its bill, at the base, is surmounted by a yellow caruncle, divided in the middle by bluish-black feathers; near the ears is a greenish white spot; the eyes are black, and their orbits yellow and striped with black; the top of the neck is bluish; the wings are black, and all the rest of the plumage is snow white.

The natives of those northern countries pursue and kill these geese, in the moulting season, on lakes and ponds. At other times they hunt them on land with dogs, or catch them in pits, covered over with herbs.

BLACK-BACKED GOOSE. (L'Oie de Bronzée. *Anas melanotos*, Lath. fig. col. pl. in Buffon, No. 937.) The metallic glosses of gold, bronze, and steel, which glitter over the upper part of the body on a black ground, have gained him the denomination of bronzed goose. The

head, and half of the upper part of the neck, are dotted with black, on a white ground, by small ruffled feathers, and curled up, as it were, on the back of the neck; the whole front of the body is white, tinged on the sides with grey. This beautiful goose is of the largest size; a broad fleshy knob, in the shape of a crest, surmounts at its base the bill, which is of the same length as the head; the whole is black, as are the feet, and the quill-feathers of the tail wedged very much. The wings of the male and female are armed with a long and dangerous spur, which makes these birds dreaded by their enemies. The female has the caruncle on the bill much smaller than the male. This species is found along the coast of Coromandel and to the north of the Ganges. It is somewhat rare in that part of India; but it is very common in the Islands of Ceylon and Madagascar. The geese of this species roam sometimes at great distances from their native place. Girardin, a professor of natural history, at Epinal, has assured me that in 1774, he saw one that had been killed on the great pool of Biccour, in Vosges Lorraines.

CANADA GOOSE. (L'Oie à cravate.) (*Anas Canadensis*, Lath. fig. col. pl. in the natural history of Buffon, No. 346.) It is a fine species, which it would be useful to multiply. It is larger than the common tame *duck*, and its flesh is more delicate. There used to be a great quantity of these geese on the grand canal at Versailles, and on the fine sheets of water at Chantilli. They are called in France *Canada geese*. They are brought up likewise in Germany and England. Their native country is North-America. They appear in winter at Carolina: they are seen in the spring, passing in flights to Canada, to return to Hudson's Bay, and other northern tracts of the New Continent.

Although larger than the tame *duck*, the Canada goose has a neck and body more slender and longer; a white bar crosses its black throat; the head and neck, as also the bill and feet, are of a lead colour, and the rest of the plumage is brown mixed with grey; the feathers on the rump and the quills on the tail excepted, which are black.

BARRED-HEADED GOOSE. (L'Oie à coiffe noire.) (*Anas Indica*, Lath.) I have thus styled, in my *additions to Buffon's Natural History*, Vol. 61, of my edition, pag. 242, a new species of the goose, to which M. Latham has assigned in his *Index Ornithologicus*, the denomination of *Indian-goose*, and that of *barred-headed goose* in his other

work, intituled : "*General Synopsis of Birds.*" The first of these denomination cannot be considered as specific, since in India there are more than one species of geese. Two parallel crescents of black, whose horns, curved up towards the eye, form a kind of hood on the back part of the head of this bird. There are some black spots on the upper part of the neck, which is of a white colour, as are also the throat, the rump, the inferior coverts, and the tip of the tail; the feathers on the back are grey, with a lighter coloured edge; a pretty ash-grey is the colour of the bottom of the neck and that of the body, except the back part of the belly, where the feathers are brown and edged with white; the quill-feathers of the tail are grey; the bill a yellowish brown with the nail black; lastly, the legs are fawn-coloured.

At the beginning of winter, these barred-headed geese are seen to arrive by hundreds in the peninsula of India, they there do great mischief in the country. They are supposed to come from Tibet and other parts towards the north, where they return again in the spring.

RUFUS-NECKED DUCK. (*L'Oie à cou roux.*) (*Anser ruficollis*, Lath. fig. pl. 4, of the *spicilegia zoologica*, by Pallas.) This is a very pretty species, rather scarce in Russia, in the northern parts of Siberia, on the shores of the Caspian sea, and along the Volga. It is presumed to pass the winter in Persia. Some individuals of this species have even been found in England; there was one caught near London, in the month of October, 1793; it soon got tame. It was fed upon cabbage leaves chopped up, and it refused to eat corn.

This bird very much resembles, in his shape, make and gait, the Canada goose. The bill is very small, and the down is long and very fine; the head and throat are black; there are a few whitish spots on the forehead, and a broad white patch, nearly rounded, on the cheeks; the black on the throat points backwards down each side of the neck till the middle of its length, which is separated from the black above by another white patch, which covers the temple, and descends and loses itself in the bright rufous colour that covers the whole front and the sides of the neck; at the top of the breast is a double bar, white and black, which runs up the neck to the nape; the breast appears covered with black and white scales; the belly is of this last colour, and the sides are lineated with black; the back, the wings, the rims of the eye-lids,

the bill, and the legs are black; the irides are of a yellow brown; the whole length is about 22 inches 4 lines; and the weight about three pounds. The female is smaller; she has no white spots on the forehead; the black on her neck does not spread near so much; the colour underneath the neck of a less bright rufous, and the bar on the neck with black irregular stripes.

Messerschmidt, who at first described this fine goose, says, that its flesh is very savoury, and does not smell at all of fish or marshy places.

As for the rest, this species appear to me to be that which the Ostiacks name *Loohe*.

THE HALF-WEBBED GOOSE. (*L'Oie à demi palmée.*) (*Anas semi palmata*, Lath. fig. gen. syn. Latham, suppl. 2. pl. 159.) This singular species is but lately known. It is described in the 4th vol. of the *Linnean Transactions of London*, pag. 103, and in Mr. Latham's second *Supplement to the General Synopsis of Birds*. Its native place is Botany Bay, a country abounding in new and curious objects of natural history.

The inhabitants of Botany Bay give this bird the name of *Newalgang*. The denomination of *half-webbed*, refers to one of its most singular attributes, that of only having the membranes which unite the claws, to join them only in a part of the length; this bird has therefore more than any other of the palmipedous order the facility of perching on the branches of trees. It is frequently met with in that position, in which it utters a whistling note, like that of the whistling duck.

The half-webbed goose is of the size of the common goose; the head, neck, legs, blackish-brown; a collar, the rump, and beneath the body white; the rest of the plumage grey; the bill brown; feet red.

Another peculiarity which this new species is distinguished by, is the construction of the wind-pipe. This duct is very long, and in it's numerous circumvolutions it projects out of the breast, and is then covered by the skin only. The figure of this wind-pipe is to be seen, with that of the bird, in the work above quoted.

EGYPTIAN GOOSE. (*L'Oie d'Egypte.*) (*Anas Ægyptiaca*, Lath. fig. col. pl. in Buffon, No. 379.) It has been also called *Nile goose*. It is, in fact, very common along that river, and in all the inundated parts of Egypt, as well as in Abyssinia, in all the south of Africa, as far as the Cape of Good Hope. According to Mr. Bruce, it builds

its nest on trees, and is almost always perched thereon, when not in the water. Some stray-ones now and then shew themselves in France. This goose is somewhat smaller than the common *wild goose*; the bill, sub-cylindrical, is clear chesnut at the base, black at the tip, and the rest is red. Its feet are of this last colour, and the claws blackish; the crown is white; the temples, orbits, bottom of the neck, and quill-feathers of the wing, nearest the body, bright chesnut; the body waved with brown and ferruginous; throat and belly whitish; the lesser and the middle wing coverts whitish; the latter with dark margins; the larger ones green, waved with bronzed green, turning to violet: lastly, the primary quill-feathers black. Latham says, that the bend of the wing is armed with a short obtuse spur.

The *wild Goose of the Cape of Good Hope*, described by M. Sonnerat, in his *voyage aux Indes et à la Chine*, is only a variety of the *Egyptian goose*, produced by age or sex; the back, rump, and wings are chesnut; breast black, and bill grey.

ESQUIMAUX GOOSE. (L'Oie des Equimaux.) *Anser Cærulescens*, Lath. fig. pl. 152 in Edwards.) It is rather smaller than the common *wild duck*; the head and neck are white, with a shade of yellow on the crown, and black spots above the neck; the bottom of the neck, the breast, flanks, and back are brown; the belly white, as also the feathers on the thighs; the rump, and wing coverts pale blue; the primary quill-feathers of the wing, blackish; those of the tail striped with black and white: lastly, the bill and feet, red. The female has the top part and point of the bill, black; forehead, white; temple, blackish; the middle of the tail, white; and the rest, black. This species is found in the southern parts of Hudson's Bay, where it bears the name of *cath catue we we*, at Fort Albany and Canada. The natives of those countries, says M. Pennaut, (Arctic Zoology) believe that, to shun the cold, these birds fly towards the sun, till they burn their head with the heat of that luminary. M. Latham mentions two very slight varieties of this species.

CHINESE GOOSE. (L'Oie de Guinée.) (*Anser cygnoides*, Lath. fig. col. pl. in the Nat. Hist. of Buffon, No. 347.) Its size surpasses that of other geese, and comes near to the swan. It again resembles this bird in another respect, by a fleshy substance, raised on the base of the bill; but it differs from the *swan* and the common goose by a

wattle or skin, which in hanging forms a pocket beneath the throat. The plumage is grey on the head and neck; grey-brown on the back; fawn-coloured in the front of the neck, the breast, and flanks; the wings and tail, brown; lighter on the tail; the bill and its tubercle, as well as the irides, are reddish; the feet yellow orange, and the claws black. Some modern ornithologists have laid down, as constant varieties in this species, trifling differences, which, in my opinion, are rather owing more to age or sex. The Chinese goose has a less ignoble gait than the common goose. She glides through the watery element with its head raised, neck straight and arched out, give it an air of dignity; its note is loud, shrill, and it often utters it; it equals, if it does not surpass, the common goose in vigilance. Although a native of the burning countries in Africa, this bird is very well naturalized in the frozen parts of the north of Russia and Siberia; it is there common, but in a domesticated state, and this peculiarity has gained it the name of Muscovy or Siberia goose, as the wattle on the throat has caused it to be styled the large cropped goose. The wide dissimilitudes between this and the common goose, do not prevent it from coupling and breeding with it. In the north, the inhabitants are possessed of a great many mixed breeds, which, by continually mixing with the common duck, draw more and more near to black. It cannot be a matter of doubt, but that the Chinese goose would answer as well in France as in the northern countries, to which it is very well inured; its beauty and large size would merit a distinguished place in our farmyards, and it would prove as useful, as it is easy to enrich them with this new tribe.

SNOW GOOSE. (L'Oie hyperborée.) *Anas hyperborea*, Lath.) This species, which has also been called *snow-goose*, is common only in the arctic regions, where perpetual cold freezes the ground, and scarcely permits it in summer to thaw above a foot deep. It is seldom met with in numbers but towards the 130th degree east longitude. Its preferred abode is in those countries bordering on the frozen ocean, and it is in those severe regions that it gives itself up to love and to its own propagation. These birds begin, early in the spring, to arrive in Siberia, in flocks of three and four hundred each, from the eastern part nearest the pole; proceed up the Lena and the Jana, even before the breaking of the ice, in search of lakes, marshes, and fens, which may at that time afford them a plentiful sup-

ply of insects and aquatic plants. They are seen also to spread, every year, as far as Jakutsk, but they seldom proceed farther; they do not even remain there long; and as soon as the warm season comes on, they return back to the frozen ocean to breed.

Birds of this species which sometimes appear in less severe countries, must be looked upon as stragglers; such were those seen by Schwencfeld in Siberia, and Marsigli near the Danube.

These geese also make excursions sometimes to North America. Innumerable flocks are to be seen at Hudson's Bay; and they also appear to frequent the opposite coast, for they have been seen at Bunalaschka. The natives of Hudson's Bay, those of Kamschatka, and several other tribes of the north, who kill them by thousands, pluck them, and after taking the entrails out, put them into holes dug deep in the earth; this is winter provision, which keeps in a perfectly sweet state, and which is a great resource for them. A remark that may perhaps be useful in other circumstances, is, that if for the sake of cleanliness, hay or branches were laid over the bodies of geese; so piled together, they would soon get tainted, whereas the earth alone is thrown immediately over them, which keeps them in a perfect sweet state.

The *snow goose* is snow white all over; it has only a yellowish tinge on the forehead, and the eleven primary quill-feathers of the tail black in the half of their length; the bill and feet are red; the irides, yellowish brown; the total size is a medium between that of the tame and the laughing *duck*; and the usual weight of it is five pounds.

It has not that shy mistrustful nature of the common wild *goose*: it is easily approached and killed. Its want of thought is extreme, and borders on stupidity. The manner in which they are hunted by the Jakutes of Jana, and Indigirka, will serve as a specimen.

Chase of the Snow-geese.

The most favourable season is between the end of April and the month of June. At all other times, these *geese* are lean. When a flock is perceived at pasture, near a river, a large net is laid on the very bank of the river, or a hut is built with skins sewed together. A hunter, entirely covered with the skins of white rein-deers, makes

up to the *geese*, who do not shun him, walks at their head, while two or three other hunters in the mean time excite them by whistling, to follow their perfidious leader ; they actually follow him as far as the net, which closes, and sometimes takes all the too easy and confiding flock. If a hut is put up instead of a net, the *geese* do not scruple to enter it with their guide. When it is filled with them, the door is closed, and they are knocked on the head, as a reward for their confidence.

BUSTARD GOOSE. (L'Oie des Isles Malounies ou Falkland.) (*Anas lucoptera*, Lath. fig. pl. 10. in Brown's *new Illustrations of Zoology*.) French navigators, who for the first time saw these birds at the Falkland Isles, gave it the name of *bustard*, on account of its tall legs and easy gait ; it flies with equal ease, and its note is by no means disagreeable. The male is snow-white, he has only some black lines on the shoulders and the flanks ; the primary quill-feathers of the wings are black, with a transverse white band, and a large green spot ; the two middle tail-feathers are black, and the others white ; the legs are black, and the bill is of an obscure brown. The female is fawn-coloured, and her wings are adorned with changeable colours ; she commonly lays six eggs. The wings of these birds have a blunt spine at the bend. Their flesh is wholesome and palatable.

KASARKA GOOSE. (L'Oie Kasarka.) (*Anser Casarka*, Lath. fig. pl. 15, of Gmelin's Travels,) a name given in Russia to this species, remarkable for its habits. It neither has the heaviness, nor the awkwardly balanced gait, nor the mean look, nor the disagreeable screams of the birds of its family ; it has a full and easy gait ; dignity in all its attitudes ; it flies lightly, and without any noise ; and its note, which is compared to the huntsman's horn, or naval trumpet, pleases the ear. Kasakas, moreover, are not gregarious like the common *goose*, and they are never seen but in pairs ; and this durable attachment between male and female, is a sure sign of the goodness of their nature. They are neither fearful nor shy ; but man, at whose hands they could not expect any mercy, does not seek to kill them, because they are very bad game. The Tartars of the Crimea, on the authority of de Tott, even pretend that their flesh is a very dangerous aliment : "however," adds this traveller, "I chose to taste it, and I found it only very bad." (*Mémoires du Baron de Tott sur les Turcs et les Tartares*, tom. 1. pag. 222.) This positive assertion

contradicts that of Gmelin, who holds the flesh of the kasarka to be very savoury. (*Syst. Nat. Linn.*)

It is in caverns and the crevices of rocks that the kasarkas build their nests; the female lays from eight to ten eggs, with a white smooth shell, and larger than those of the wild duck. As for the rest, these birds pass the winter in Persia and India, and the summer in the most southern parts of Russia.

The kasarka goose is not larger than the wild goose, but stands higher on the legs than the common goose. It measures one foot ten inches in total length; its plumage is rufous; or rather of a bright brick-dust colour; the head is of a light fawn colour, and the rump brown, striped with fawn colour; the quill-feathers of the wings and tail are black, as is also the bill, irides and legs; the coverts and all the upper parts of the wings are of a white colour. The male has a black collar which the female has not.

HARVEST GOOSE. (*L'Oie des Moutons.*) (*Anas segetum*, Lath. fig. pl. 94, fig. 2 of the *British Zoology*.) This species goes under a denomination that bespeaks the havock it does among the corn that is as yet green. It is found in great numbers in the Hebrides and Hudson's Bay, and it is seen arriving in England and in Austria at the latter end of August to pass the winter, and to depart in the month of May. All its upper parts have a hue almost uniform of a dark ash, which is mixed with a reddish colour on the head and neck, and with white on the rump; the lower parts are whitish, the wings grey and the greater coverts, as also the middle quill-feathers edged with white; the bill, which is small, is reddish in the middle; its base and tip are black; the legs are red, and the claws white; the total length of this bird is about two foot and a quarter.

Notwithstanding the authority of Pennant and Latham, I can hardly believe that this harvest goose is distinct from the common species of wild geese.

MOUNTAIN GOOSE. (*L'Oie de Montagne.*) (*Anser montana*, Lath.) Kolbe, and long after him, Barrow, have seen it at the Cape of Good Hope; it frequents particularly the valley of *Waveren*, or *Roode-sand*. Larger than the tame goose, this bird has the head, neck and quill-feathers of the wings of a very beautiful glossy green.

PAINTED GOOSE. (L'Oie peinte.) (*Anas picta*, Lath.) It is not sufficiently well known, as neither is the Magellanic goose, in order to decide whether the one and the other are not of the same species, but merely birds of different sex. The plumage is in general of a blackish ash, with transverse black lines, but its head, neck, middle of the belly, coverts, and bar on the wings are white; the quill-feathers of the tail and wings, the bill and feet are black; the wings with an obtuse spur on the bend. Navigators have found this bird in the Straights of Magellan and Terra del Fuego.

LAUGHING GOOSE. (L'Oie rieuse.) (*Anas albifrons*, Lath. fig. in Edwards, pl. 153.) Its note, which has most likely been found to agree in some measure with laughter, has probably gained it the denomination by which it is known. It is of the size of our wild goose; its forehead is white; its plumage is brown above, and white, with a few blackish spots beneath; its bill and legs are red. The hues of the plumage of the female are lighter; its bill is of a pale yellow, except the tip, which is whitish; and its feet are fawn-coloured. This species inhabits the northern countries of the new continents; it is found to the north of Sweden, in Siberia, and in Hudson's Bay, and probably in Greenland. Edwards says also he has seen it at London, in hard winters. An immense quantity of these geese, as well as tame geese, are found, especially in summer, in the east of Siberia; in autumn they meet, from all quarters of Siberia, on the peninsula of Kamschatka, whence they descend more to the south; but in the beginning of spring they return to Kamschatka, fatigued and lean; and from thence they spread afresh all over Siberia, and soon get plump again, by the abundance of fresh pasture. Other flights of these birds, on leaving their winter-quarters, take an opposite route, and cross the northern ocean, pass over to Europe, and disperse in Germany, Sweden, Poland, as far as Russia.

GREAT GOOSE. (L'Oie sauvage de la grosse espèce.) (*Anas grandis*, Lath.) It is the largest of all geese; it is of the size of the swan, and it weighs more than twenty-four pounds. The body is blackish above, and beneath white; the base of the bill is tawny, the rest black; and the legs are scarlet. It is found in the east of Siberia as far as Kamschatka; it travels but little, and hardly ever leaves the same countries; it frequents lakes and ponds at night, and corn-fields and meadows in the day-time.

MAGELLANIC GOOSE. (L'Oie des Terres Magellaniques.) (*Anas Magellanica*, Lath. fig. col. pl. in Buffon, No. 1006.) Larger than the common goose, it has the head and top of the neck purple; the bottom of the neck, the breast, and upper part of the back festooned with black on a rufous ground; wing-coverts white, as also the bar across the blackish quill-feather; the tail and bill black, and legs yellow. The denomination given to this bird points out the country it inhabits.

GREY-HEADED COROMANDEL GOOSE. (L'Oie à tête grise de Coromandel.) (*Anas cana*, Lath. fig. pl. 41, the male, and 42, the female, in Brown's *Illustrations of Zoology*.) It inhabits the mountains of the colony of the Cape of Good Hope. The Dutch call it *bergeuten*. M. Sonnerat has also described it on the coast of Coromandel, (*Voyages aux Indes et à la Chine*, tom. 2, pag. 220.) This species is rather smaller than the Egyptian goose. The male has the head, and nearly the whole of the neck, of a pale ash colour; cheeks white; the whole body earthy rufous, not so bright beneath as above; the feathers of those parts terminated by a more obscure edge; wing-coverts white; the primary quill-feathers black, and secondaries dark brown; the inferior tail-coverts ferruginous, with a black transverse line; lastly, the tail itself, the bill and legs black; an obtuse spur at the bend of the wing. The colour of the female not so bright, and her cheeks are of the same grey as the head.

VARIEGATED GOOSE. (L'Oie variée.) (*Anas variegata*, Lath.) English navigators have met with it at New Zealand; size of a large duck; the head, the upper part of the neck and lesser wing-coverts, white; back blackish, spotted with white; the rump and inferior tail-coverts ferruginous. The secondary quill-feathers of the wing green; the primary, as also the tail-feathers, the bill, and legs, of a black colour; an obtuse spur at the bend of the wing. (Son.)

ELDER DUCK. (Oie à duvet ou Eider.) (*Anas molissima*, Lath. fig. col. pl. in Buffon, No. 209, the male, and No. 208 the female.) This bird bears, in several northern tongues, the name of *eider*, a word which has been adopted among us, as well as the word *eider-down*, which we pronounce *edder-down*, that is, *down of the eider*. The denominations of *down goose* and *duck* have been applied to this bird; in point of structure, it, in fact, agrees almost as much with *geese* as with *ducks*, whereas, by its habits,

it agrees more with the latter. However this may be, the ornithological method followed by us, (M. Latham's,) has ranked it, as also every species of *geese*, with the genus of *DUCKS*. (See this word.) This palmipede is not quite so large as the common *goose*; its total length is about two feet, and the extent between the two extremities of the extended wings is two feet eight inches. Some small feathers, shorn like velvet, spread sloping from the forehead on the two sides of the bill, and almost as far as under the nostrils; the bill black, as are also the legs, is cylindrical; its base is surrounded by a wrinkled membrane, and which separates in two towards the forehead; the top of the head and belly is of a blackish brown; the same hue colours the quill-feathers of the wing, those nearest the body excepted, which are white. A broad green spot covers the bottom of the nape; the back is white, as is the breast; but on this latter part there is a reddish mixture. The female, not so large as the male, has its plumage streaked transversely, and in waves with blackish and rufous, on a grey-brown ground; the belly, the quill-feathers of the wing and tail, of a brown colour. It is only in the fourth year that the plumage constantly remains the same as it has been just described; until that time it varies in the young ones; it turns to grey in very old age; for it is said that *eider-ducks* live a very long time.

They do not quit the northern latitudes; cloathed with a thick coating, they brave the rigours of the coldest latitudes; they proceed as far as Spitzberg. The most southern point of our continent that they frequent is Britain; and even there a few stragglers are only to be seen. I am not acquainted with any instance of their having been seen on our shores on the ocean. In America they are found in the Esquimaux islands, in Canada, the Miquelon isles, and sometimes in the states of New York. These birds, by means of their great muscular strength, are enabled to keep a long time on the wing, soar on the open sea towards the north pole, and visit its extent in every direction where it is free from ice. Their cruise lasts all day, and they alight on the ground in the evening only, unless an approaching storm obliges them to make land in the course of the day. So active a life, scarcely admitting of any repose, sufficiently indicates that *eider-ducks* do not, as the other species of *geese*, find their food on the ground, and that they do not feed like them.

It is in the liquid plains, agitated by the arctic seas, that they seek their subsistence. This consists in fish and shell-fish, which they catch on the surface of the water, or in diving under it to a great depth. In winter they are seen in hundreds, and even in thousands. In the summer season, they fly in pairs. In this species the number of males is smaller than that of the females, and this disproportion occasions sharp contests in the pairing-season. Those males who, in these struggles, the motive and end of which is love, have proved to be the weakest, and have fled before more successful rivals, because they had more strength, constrained to resist the most imperious law of nature, fly singly and at random. It is these, undoubtedly, that occur in those countries that may be stiled *southern*, when compared with the higher regions, the habitual abode of the species.

Eiders build their nest with moss on rocks, on piles of stone, in the midst of herbs or fern, but always near the sea. They lay five or six eggs, of a deep green, which are eatable. M. Brunnick, an eye-witness, describes, in the following manner, the loves of the *eiders*, and the care that these birds take of their offspring. "In the pairing-season, the male is continually heard to cry *ha, ho*, in a rough and complaining note; the note of the female is like that of the common duck. The first care of these birds is to endeavour to place their nest, so as to be sheltered by some stones and bushes, and particularly the juniper-shrub: the male works with the female, and the latter plucks the down from herself till it forms all around a large swelling pad, which she turns down over her eggs, when she leaves them to get her food; for the male does not help her in setting, he only keeps on the watch hard by, to give notice when the enemy is in sight: the female then hides her head, and when the danger runs high, she takes to the wing, and makes up to the male, who, it is said, ill-treats her if any harm comes to the brood. Crows are fond of the eggs; and kill the young ones; therefore the mother is in haste to make the latter leave the nest a few hours after they are hatched, taking them on her back, and flies gently away with them to the sea-side. From that time the male leaves her, and neither of them come afterwards to land; but several broods join one another at sea, and form flocks of thirty or forty young ones, with their mothers, who lead them, and are in

cessantly endeavouring, by beating the waves, to make the slime and sand come up with the water from the bottom, and with these, insects, and even small shellfish, which are food for the young ones, as yet too feeble to dive. These young birds are found at sea in the month of July, and even as early as June; and Greenlanders reckon their summer season by the age of the younger *eider-ducks*." (*Onithol. Dan.*)

The down, which the *eiders* pluck from their own stomach and belly, to line the nest with to warm their eggs and their young ones, is very carefully sought after in all countries where this bird is common. It is the softest, the lightest, the warmest, and most elastic of all downs: luxury and effeminacy stuff their cushions and beds with it. Norway and Iceland supply this precious article; it is very dear there, and sells as high as a pistole per pound when it is well picked. The nests of *eider-ducks* are, for the inhabitants of the coasts, a kind of estate, the stock of which, although free and independent, is not the less constant and certain. Every one peaceably enjoys those nests placed on his land; and does his utmost to allure over other pairs of *eiders*. A heavy fine is against any one that kills one of these birds. A single person, especially if his habitation is situated on one of those rocks that are most distant from land, may gather, in the course of a year, from fifty to one hundred pounds of down. The Danes and the Dutch buy up all that is gathered of it. The Iceland Company, sold down, according to Troil, (*Lettres sur l'Islande*) in 1750, to the amount of 3747 rix-dollars, independant of the quantity that was sent direct to Gluckstadt. The down taken from the bird when dead, is of an inferior quality to that which the bird plucks from itself.

Eider skins, with all their feathers and down on, are used in furs, which enter into the northern trade, especially with China. The natives of the Aleout islands, as Billings informs us, prepare, with the skin and feathers of *eider-ducks*, robes and mantles in high repute, because they are softer, warmer, and, at the same time, stronger than any others. The flesh even of the *eider* is palatable; but it is with great difficulty, and for every possible reason, that they resolve upon killing creatures whose product is so very precious.

Mauduyt proposes (*Encyclop. Method.*) to make experiments to naturalize *eider-ducks* in France. We shall not

advise these essays, who to us seem likely to be unattended by any success. In fact, who can hope to bring up and preserve in our climate, a species that delights only in a frozen temperature, frequents only the sea, and lives only on the animals that breed between rocks, islets, and, most frequently, in the midst of the ice? (S.)

OF THE DUCK.

DUCK, (*Anas*,) a genus of birds of the palmipedous order. Characters: bill lamellate and denticulate, convex and obtuse; nostrils oval; tongue fringed and obtuse; feet webbed; the three hind claws united by entire membranes, and the hinder one solitary. (M. Latham.) This genus is very numerous in species, principally in books of methodical ornithology, where *swans*, and *geese* are joined to *ducks*, properly so called. The bill of the latter is broad, flat beneath, convex above, more broad than thick, and terminated by a nail harder than the rest; whereas, *geese* have the bill thicker than it is broad: their tail is very short, and their legs, shorter than the body, are advanced towards its middle, and out of the abdomen. From this situation of its legs, results the difficulty in walking and keeping steady on the ground; but, in the water, these birds have very easy motions.

We shall, in this article, make it our business to give the history and description of *ducks*, properly so called; and we assign, to the heads of **SWAN** and **GOOSE**, those birds generally distinguished from true *ducks*.

BARBARY DUCK, (Canard de Barbarie,) a denomination mostly applied to the *Muscovy duck*, which is however a native of the hot countries of the new world.

CURVE BILLED DUCK. (Canard à bec recourbé.) (*Anas recurvirostra*. Lath.) This bird, rather larger than the *wild duck*, and noted by its turned up bill, is almost entirely black; this colour throws waves of dark-green over the head, neck, and rump; the five outer quill-feathers white, and this same hue forms an oval patch on the chin; the irides are white.

THE NARROW-BILLED DUCK, a denomination given by some to the *Sula*.

THE MEMBRANACEOUS-BILLED DUCK. (Le Canard

à bec membraneux.) (*Anas membranacea*. Lath.) Some dissimilarities occurring, either in the shape of the body or the bill, either in the singular disposal of the colours, or in the structure and length of the feathers, characterize the greater part of the birds of the antarctic regions. Among the palmipedes, the bushy-headed *duck* is distinguished, and is remarkable for the long slender feathers which cover the occiput and the nape; the lobated *duck*, (see these two words) which has a wattle hanging beneath the lower mandible, and this last, whose long bill, increasing in width from its base to its extremity, is, in part, soft and membranaceous, a consistence which characterises the bill of another *duck*, inhabiting the same country, but which differs in colour. (See *soft-billed duck*.) The hue of the mandible is black, and that of the irides blue; the top of the head, a large patch surrounding the eyes, and the upper part of the neck, are blackish; the back and wings ferruginous brown; two streaks of this same colour pass along the sides of the head, the one above, and the other below the eyes; a few quill-feathers of the wings, the lower part of the rump, and the tail, are dotted with very pale spots; the sides, the front of the neck, and all the body above, are dirty white, transversely varied and spotted with a brown that turns blackish on the sides of the lower part of the belly, and on the parts of the flanks hidden by the wings; size of the common *duck*; length from eighteen to nineteen inches. This species, named *wongi*, by the natives of Botany Bay, is rarely to be met with there.

New Species.

THE SPOTTED-BILLED DUCK. (Le Canard à bec taché de rogue.) (*Anas poekiloryncha*. Lath.) Although this *duck* is common in the island of Ceylon, and in the East Indies, the English ornithologists, who have made it known to us, neither give its length nor its size. The bill is long, mostly black, the tip white, with a red spot on each side at the base; a black band proceeds from the bill, crosses the eyes, and extends to the sides of the head; the cheeks, and part of the front of the neck, are of a whitish ash; the lower part of the belly is black, as are also the primary quill-feathers of the wings, and the rest of the plumage, secondaries excepted, which are white, and the *vent*, which is of a glossy green, edged with white and black. The legs are yellow-rufous.

BROWN DUCK. (Le Canard brun.) (*Anas minuta*, Lath. col. pl. No. 1007, of the *Nat Hist. of Buffon*.) This duck has so great an analogy with the brown and white teal, that Latham looks upon them to be one and the same species of bird. This is of a middle size, between the wild duck and the teal. The upper parts of the body are of a blackish brown; the neck and breast reddish brown, waved with white grey; the belly, wing-spot, and another spot between the bill and the eye, whitish.

A duck has been found on the shores of the Caspian Sea, which differed from this only in the rump, which is entirely white.

DUSKY DUCK, (Le Canard brun de New-York.) (*Anas obscura*, Lath.) measures about two feet in length; longitudinal blackish bars on the neck; the feathers on the upper parts of the body lightly edged with yellow; the vent blue, edged with black; the primary quill-feathers of the wing and tail blackish, with a white purfling at the extremity of their webs; the rest of the plumage brown; the legs of a yellowish brown, and the tail wedged. This duck is found in winter in the environs of New York.

LOBATED DUCK. (Le Canard caronculé.) (*Lobated Duck*, pl. 255, *Nat. Mis.*) This New Holland duck is distinguished from all others by a large rounded wattle, and of a very dusky colour, which grows at the base of the lower mandible, and hangs down the throat. Its size is that of the wild duck; its bill is large, hooked at the tip, and of a deep black; this colour extends almost over the whole of its plumage, and is mixed with numerous longitudinal, transverse, vermiculate lines, and very small spots, more or less pale and whitish; the chin, the lower part of the neck, and belly, are irregularly spotted with black, on a white ground; the tail is pointed, and the legs are lead colour. *New Species*.

BUSHY-HEADED DUCK. (Le Canard chevelu.) (*Anas jabuta*, Lath.) On the banks of the river Hawksbury, in New South Wales, and often on the trees of neighbouring forests, is seen a duck remarkable for its long, slender feathers, which, growing on the occiput and nape, overshadow a part of the neck; a velvet-black spot placed on their tips, strikes out, with so much the more eclat, as their prevailing colour is of a dirty rufous; but what completes the beauty of this palmipede, is the pretty mixture of hues which deck the breast; each feather of a

rufous-brown, terminated by a silvery-grey, has on the edge two small blackish spots; this distribution displays such perfect symmetry, that this part appears at once undulated with grey, brown, and spotted with black; a chocolate colour covers the head and neck; a brownish ash is displayed on the top of the back, wing-coverts, and scapulars, whose outward web is black, as well as the rump; the middle of the belly, the subsequent parts, and quill-feathers of the tail, the sides of the breasts and flanks are grey, and varied with small transverse and vermicular lines; lastly, a bronzed green, edged with snow-white above and below, characterizes the vent that distinguishes *ducks*. Size of the *widgeon*; length, twenty inches and a half; bill black, shorter than it commonly is in ducks; legs brown.

The female differs in having the lower part of the belly white, and the vent smaller and even hardly visible. M. Latham describes another male, whose colours are brighter, and whose feathers on the nape are more extensive. The head and neck are of a fine rufous; the lower part of the breast and the middle of the belly are of a pretty grey, and each feather is tipped with a brown crescent; four or five large black patches, and of an irregular form, are dispersed over the back; the legs are black. *New Species*.

HARLEQUIN DUCK. (Le Canard à collier de Terre-Neuve.) (*Anas histrionica*, Lath. col. pl. No. 793 the male; No. 799 the female, in *Buffon's Nat. Hist.*) This pretty palmipede, nearly the size of the *tame duck*, is found not only in North America, but also in Kamschatka, on our shores, near Lake Baikal, in Siberia and in Greenland, where it frequents, during the summer season, shady places and rivers; in winter, the ice forces it away from them; it then retires to the coast, and even puts out to open sea. 'Tis said to be better game than the *wild duck*. The male has the crown and neck black, a white patch on the ears, and another between the bill and the eye; a small bar above the latter, of the same colour, which turns to a rufous hue on drawing near the occiput; the sides of the head of a purple blue; on each side of the neck, a white longitudinal bar; a band of this same colour, and purpled with velvet-black, crosses the breast; a second passes above the origin of the wings; the back of a blackish brown; the rump and tail-coverts of a very deep dark blue; the breast rusty; the belly grey-brown;

the flanks bright rufous; the quill-feathers of the wings and tail brown; the vent of a purple blue; the bill blackish; the legs of a lead colour, and claws grey.

The female is destitute of this splendid clothing; grey is spread over the whole of the plumage, and turns to a blackish hue on the head, and almost white in front of the neck and breast; lastly, this last colour is pure on the belly. Latham affirms that this female is the *duck* described under the name of *brown duck*, and *brown and white teal*. See these two words.

THE RED-CRESTED DUCK. (Le Canard à crête rouge.) *Sonnini's edition of the Nat. Hist. of Buffon.*) This *duck*, from New Zealand, but which is not common there, is found in the bottom of Dusky Bay. A red crest grows on the head; a very glossy black grey is predominant on the back; and a deep greyish soot colour on the belly; the bill, the legs, are lead colour, the irides golden.

THE MAGELLANIC DUCK. (Le Canard du détroit de Magellan.) Some navigators have given this denomination to the *Mareca*, which see.

THE TAME DUCK (Le Canard domestique) is of the same species as the *wild duck*. (See this word.) Domestication has produced many varieties of this captive portion of the species. See also the article *Duck*, rural and domestic economy.

DOMINICAN DUCK. Le Canard Dominicain du Cap de Bonne Espérance.) (*Anas Dominicana*, Lath.) It is to a learned traveller and enlightened naturalist that we are indebted for the knowledge of this *duck*. Sonnerat, who has observed it at the Cape of Good Hope, thus describes it:—"This bird is of the size of the *wild duck*; the face and chin are white; at the upper corner of the bill, is a black longitudinal bar, which being intercepted by the eye, terminates at a sharp point a little further on; the hind head, the neck and breast are black; the back and secondary quill-feathers of the wing are of a deep grey ash, crossed by two bars of a very light ash brown. The primary quill-feathers of the wings and tail are black; the belly and tail-coverts beneath are of a light grey; the bill and legs black.

EIDER DUCK, (L'Oie à duvet,) a name given by some to the *EIDER*. See this word.

SPANISH DUCK. (Le Canard à face blanche.) (*Anas xiduada*. Lath. col. pl. No. 808, in *Buffon's Nat. Hist.*) This beautiful species, which is taller and larger than the

wild duck, is met with in Spain, and on the coast of Barbary. Its bill and eyes are black; the forehead, cheeks, and chin of a pure white; this colour also covers the back part of the head, the crown of which is black, as is that of the collar which encircles the neck; the back and breast are of a brilliant rufous, ornamented with waves and festoons, blackish and rufous; the wings and tail are blackish; the belly is brown and dotted with black; the legs are bluish. Spaniards give the name of *vindila* to this species, whose note is very shrill, and which is very common on the lakes about Carthagera.

THE FRANCK DUCK. (Le Canard Franc.) The natives of the colony of French Guiana, call the *Muscovy duck* by this name. See this word.

THE FRENCH DUCK. The inhabitants of Louisiana so call the *wild duck* which is found in that part of America, and which they have found to be the same as that of France. See DUCK.

GEORGIA DUCK. (Le Canard de Georgie.) (*Anas Georgica*, Lath.) This species of *duck*, which is accounted very good game, is found in North America, on the lakes and rivers of Georgia. Its length is rather more than eighteen inches; the bill, turned up a little at the tip, which is black, is yellow; an ash hue, varied with reddish, is spread over its plumage; the large wing-spot is green edged with white; the quill-feathers of the wings and tail are blackish; and the legs of a greenish ash.

THE CLUCKING DUCK. (Le Canard gloussant.) (*Anas glocitans*, Lath.) The cry of this *duck* imitates the clucking of the hen: it is found in the east of Siberia, on Lake Baikal, and is sometimes seen in Britain. It measures eighteen or nineteen inches in length; the bill is lead-colour; the irides brown; top of the head of the same hue, with green waves; a round spot of a rusty colour between the bill and the eye; a small crescent of a silky green, turning to violet, on the sides of the head, behind the ears; the feathers on the occiput long enough to form a small tuft; the throat of a fine deep purple; a longitudinal bar of a brilliant green on the neck, and which extends a little over the head; the breast of a ferruginous glossy brown, dotted with black; the belly blackish and sprinkled; the upper parts of the neck and body of a deep brown, waved with black; the wing-coverts of an ash colour; the lesser streaked with yellowish; the pri-

many quill-feathers similar to the larger ones, and turning to brown; secondaries of a fine green, shaded with black and edged with white; wing-coverts of a changeable green; intermediate quill-feathers of the tail black, others brown, edged with white; the legs small and yellow; membranes blackish.

THE SOFT-BILLED DUCK. (Le Canard grisbleu.) (*Anas malacorrhincos*, Lath.) This palmipede, of New Zealand, has the same note as the *whistling duck*, and bears in that island, where it occurs, in the month of April, the name of *he-wego*. Its size is that of the *widgeon*, and measures about seventeen inches in length. The bill is ash-colour, but membranaceous and black at the tip; the top of the head of a greenish ash; the plumage in general light-blue; a white spot on the wings; the breast mixed with ferruginous; the legs of a dark-lead colour. This *duck* is remarkable in having a bill of a soft substance, so that it is only able to live by sucking in worms, which it finds in the soft mud.

DAMIATTA DUCK. (Le Canard gris d'Egypte.) (*Anas Damiatica*, Lath.) The size of this *duck*, which Sonnini has seen on the shores near Aboukir, is nearly that of our *wild duck*. The plumage is generally grey, but turns to a whitish blue on the neck, the scapular feathers, and the tail; a kind of crescent is to be observed, which surrounds the nape; the quill-feathers of the wings and tail are of a blackish green.

This species is common on the lakes and miry places of the north of Egypt: the inhabitants catch it with nets.

THE LITTLE BROWN DUCK (Le Canard a grosse tête) (*Anas bucephala*, Lath.) is a middle size between the *common duck* and the *teal*. It measures about fifteen inches in length; a tuft of long, slender feathers, of a bright green, and waved with blue and violet, covers the head, which this tuft increases very much in size by its thickness; hence the name of *buffel-headed duck*, given to this bird; the cheeks are white; the neck, the back and the superior coverts of the head black; the neck, the top of the body and scapulars white; a broad bar of this same colour extends longitudinally over the wings, which are black; the quill-feathers of the tail are grey; the legs red; and the bill is lead colour.

The female is totally brown, according to Buffon; and is, according to Latham, the *duck* described under the

name of Carolina teal. See this word. This species is found, during winter, not only in Carolina, but in New York and Louisiana.

THE HUNGARY DUCK. (Le Canard de Hongrie.) In Lorrain the *golden eye* goes by this name. See this word.

THE TUFTED DUCK (Le Canard huppé) of Salerne, is the *whistling duck*, or *widgeon*. See this word.

SUMMER DUCK. (Le beau Canard huppé.) (*Anas sponsa*, Lath. col. pl. No. 980 and 981, male and female, in *Buffon's Nat. Hist.*) This species, for the richness of its plumage, and the exquisite flavour of its flesh, must hold one of the first places among the most beautiful and most precious palmipedes. A bunch of long, silky feathers, varied with white, bright green, and purple, grows on the head of the male, and forms a superb aigrette, which nods backwards over the neck; a bronzed violet is predominant on the forehead and cheeks; the lower mandible is surrounded with clear white, which appears sloping under the eye, and longitudinally extends above; a pretty rufous colour, sprinkled with white, covers the bottom of the neck and breast, and is cut across the shoulders by two black and white bars; a splendid brown, waved with golden green, prevails on the wings, back, rump, and upper tail-coverts, some feathers of which, long and slender, and of a fine rufous, hang down on the sides; those on the flanks, of a pretty grey, are puffed, vermiculated with small blackish lines, and terminated by two bands, the one velvet-black, and the other snow-white; the belly is of this latter colour; the quill-feathers of the tail are brown, some of them with small white dots at the tip, others with the inner web of a golden green; they are, for the most part, white outwardly, and waved with blue and violet. The *vent* displays the most brilliant hues; brown and copper-green are spread over the tail, which is wedged, and composed of sixteen quill-feathers; the red is pure on the eye-lids and irides, spotted with black on the bill, and turning to orange on the legs; the webs are of a light brown; the claws are black; size of the *widgeon*; length eighteen inches.

The female, which is smaller, and whose coat exhibits plain and modest colours only, is deprived of the bunch of feathers which so splendidly ornaments the head of the male. A brown colour is prevalent almost over the

whole plumage; whitish on the throat; a mixture of blue and green on the coverts and quill-feathers of the wings and tail; and a dirty white on the belly; lastly, this hue is displayed on the breast in triangular spots, distributed in a confused manner.

This species is found in North America, from Canada, perhaps more to the north, as far as Mexico; but in the very cold seasons it migrates from the frozen regions. The cantons most frequented by it are woods, wood-coppices, where rivulets wind along; they sometimes perch on the branches which overspread them, whence it has received the name of *tree-duck*, and builds in the hollows of trees; it lays from eight to twelve eggs.

This *duck*, which to beauty adds a fine flavoured flesh, when it feeds on grain, acorns, and beach-mast, is of a shy, mistrustful disposition. Nevertheless, when taken young, it willingly grows tame; it is easily inured to the climate of France; and it is possible, with some care, to get tame breeds, and thus increase the number of the most precious of our tame fowl. For this purpose, it must be kept in a place where cats and dogs cannot disturb it; and curiosity, always unreasonable when birds are setting, must not disturb the female during the incubation, which often makes her leave her eggs.

In captivity, it is fond of setting in a small pen, laid by the margin of running or standing water, shaded with trees; the entrance must be so disposed, that she may be able to get in and out without leaving that element. It would be still better, in order to secure it from all accident, to form, in the midst of a bason, a small islet, where there ought to be a tree, at the foot of which the little hut should be laid. This situation has charms for these birds, who are fond of being in the woods only. With these precautions, one may be sure of succeeding; but it is very prudent to cut the quill-feathers of one wing, without which one would be likely to lose them.

CRESTED DUCK. (Le Canard huppé de la Terre des Etats.) (*Anas cristata*, Lath.) This inhabitant of the extremity of America, is of the size of the *wild-duck*, but is much longer, for it measures twenty-five inches in length; a tuft adorns the head; a straw-yellow, mixed with rusty coloured spots, is spread over the throat, and front of the neck; the wing speculum blue beneath, edged with white; the bill, wing, and tail are black; the rides red; and all the rest of the body ash-grey.

THE INDIA DUCK. (Le Canard d'Inde.) It is the *Muscovy duck*, brought from America or the East Indies. See **MUSCOVY DUCK**.

THE ICELAND DUCK. (Le Canard d'Islande.) (*Anas Islandica*, Lath.) Icelanders give this palmipede the name of *hra-fas-aund*. The head is ornamented with a tuft; the body beneath is white, and the rest of the plumage black; the legs are saffron colour.

THE BROAD-BILLED DUCK (Le Canard à large bec) of M. Salerne, is the *little Morillon*. See this word.

THE BROAD-BILLED AND YELLOW-FOOTED DUCK, a denomination which M. Salerne has given, in his Ornithology, to the *Shoveler*. See this word.

LONG-TAILED DUCK. (Le Canard à longue queue de Terre Neuve.) (*Anas glacialis*, Lath. col. pl. No. 1008, in *Buffon's Nat. Hist.*) This *duck* not only occurs in Newfoundland, but in Canada and in New York, during the winter. It is even asserted, that in severe winters it extends in Europe as far as the north of Britain. In the summer, it remains on the coasts of Greenland and Hudson's Bay, where it nestles in the month of June. It lays five eggs, of the size and same shape as a young pullet's, and of a bluish white; its flight is rapid, sinuous, and balanced, so that it presents, obliquely and alternately, at one time the back, and at another time the belly; its note seems to express *a-a-aglik*; its down, for beauty, fineness, and elasticity, is nearly equal to that of the *eider-duck*.

The size of this bird is inferior to that of the *wild duck*, but it appears longer, because the two long tail-feathers increase its total dimension; it has the head, neck, as far as the top of the breast, and back white, with an orange fawn-coloured bar, which proceeds from the eyes down the sides of the neck; the belly and scapulars of the same colour as the head, the rest of the plumage black; the irides red; the bill and legs of a blackish red.

The female has the crown, and sides of the neck in part blackish, a collar, and the lower part of the belly white; the back and rump black, with transverse grey stripes; the bill black, surrounded with a whitish band; the quill-feathers of the tail wedged, but deprived of the two long ones which that of the male has.

THE MADAGASCAR DUCK. (Le Canard de Mada-

gascar.) This is, in Albin, vol. iii, pl. 99, the same bird as our *tame duck*.

MEXICAN DUCK. (Le Canard du Mexique.) Brisson calls the *shoveler* after this manner. See this word.

MONACHA. (Le Canard moine.) (*Anas Monacha*, Lath.) The country inhabited by this *duck* is not known. It agrees in some respects with the *Muscovy*; but it is rather larger. Its head is white, and spotted with black; this last colour covers the breast; a large green and violet spot adorns the wings, whose quill-feathers, as also those of the tail, are white, tipped with brown; the rest of the plumage is varied with brown and black; the bill is yellowish, and the tip black.

KAMSCHATKA DUCK (Le Canard des Montagnes de Kamschatka) is the *harlequin-duck*. See the article of this bird.

MUSCOVY DUCK. Albin has improperly applied this denomination to the *Muscovy duck*. See this word.

THE MONGREL DUCK (Le Canard mulard) a name given to *ducks*, arising from the mixture of the *Muscovy* tribe with the domestic tribe. See the article *DUCK—rural and domestic economy*.

MUSCOVY DUCK. (Le Canard Musqué.) (*Anas Moschata*, Lath. fig. col. pl. in *Buffon's Natural History*, No. 989.) The epithet *musk* has been given to this *duck*, because it exhales a strongish musky scent, owing to an humour which filtrates from glands placed near the rump. To take away this musky smell from the flesh, the rump must be taken off, and the head cut off, as soon as a bird of this species is killed. It is then a very good dish, and as succulent as the *wild duck*.

This bird is much larger than our *common duck*. It measures, in total length more than two feet, and the extent across the wings, when extended, is near three; a large patch of naked, papillous skin, of a very bright red, covers the greater part of the cheeks, extends to behind the eyes, and swells at the root of the bill into a red caruncle, which Belon compares to a cherry; this tubercle is wanting in the female, as also the tuft of narrow feathers, and rather twisted, which hangs behind the head of the male; she is also lesser; both stand low on the legs, have short claws, and that of the inner claw crooked; both, since their species, or rather a portion of their species, has been reared in our farm-yards, have experienced every variety of plumage, which a long

domestication is able to produce. "At one time," says Belon, "the male is white, at another the female white; at others both are black, and at others of divers colours; hence one cannot well speak of their colour, only so far that they are similar to a duck; but are most commonly black, and mixed with divers colours." (*Nat. des Oiseaux*, page 176.) In a state of liberty, the male is entirely of a brown black, glossed with green on the back, with a broad white patch on the wings; its bill, legs, claws and their webs, are red; but there are some black bars on the bill; the plumage of the female is of a blackish brown, and is much more obscure than the male.

Although this species is commonly called *Barbary*, or *Guinea-duck*, it appears that it is in a wild state in South America only. Marcgrave has observed it in the Brazils; it is also a native of Guiana. These birds perch on the large trees that border rivers and marshes, similar to terrestrial birds; they build their nests there, and as soon as the ducklings are hatched, the mother takes them, one by one, and throws them into the water; laying takes place two or three times a year, and each is from twelve to eighteen eggs, quite round, and of a greenish white; the moulting season begins in September, and it is sometimes so complete, that the *ducks*, finding themselves almost entirely destitute of feathers, are unable to fly, and let themselves be taken alive by the Indians. These birds are as shy as our *wild-ducks*, and it is by surprise alone that they are to be shot.

The *Muscovy-duck* stocks the farm-yards of our colonies; it has long been brought into ours, where it proves profitable for its fecundity, its size, and the facility with which it fattens; but it is more expensive than any other poultry, and, to make the most of it, must be fully fed. Scaliger and Olivier de Serres have given out that this *duck* was dumb. Perhaps, when recently transported in our climates, it had lost its voice, as our dogs lost their's in America; but it is ascertained, that it utters a very low, grave cry, unless it be put in a rage. (See the description of the organ of its voice, in my note, of page 370, vol. lxi, of my edition of *Buffon's Nat. Hist.*) Larger than our *ducks*, this one is heavier and slower in walking; the male is very ardent in love, and he is to be distinguished from the birds of his species by the large portion of the organs of generation. "It will be wondered at," says Belon, "to hear that such a bird has so large a genital

member, that it is as thick as a large finger, and as long as four or five, and red as blood." (*Nature des Oiseaux.*) All females suit him; he pairs with the *common duck*, and from this union arises a mixed breed which does not breed among themselves, but which intermix and produce with the common species; the individuals resulting from these mixtures, re-produce together, and with *tame ducks*. It is by crossing the two species in this manner that fine and useful varieties are obtained. See the article of the **TAME DUCK**.

THE NILOTIC DUCK. (Le Canard du Nil.) (*Anas nilotica*, Latham.) Sonnini suspects this *duck* to be no other than *Egyptian-duck*. (See vol. lix, page 378, of his edition of *Buffon's Nat. Hist.*) This palmipede has the callosity on the edge of the bill, and the caruncle at its base, of a purple colour; the irides yellow; the top of the head, the neck, white, and spotted with grey; a white bar, which extends behind the eyes; the back whitish; the upper parts of the body greyish and striped with black; the flanks striped with grey; the tail rounded.

This species is easily tamed, and the Egyptians bring it up in their poultry-yards.

SALERNE'S BLACK DUCK, (Le Canard noir de M. Salerne,) is the *double Macreuse*; and the *little black duck* of the same author is the *Macreuse*. See this word, and that of the *Scoter*.

THE BLACK AND WHITE DUCK. (Le Canard noir et blanc.) This is, according to Edwards, *the black and white Teal*. See this word.

THE LARGE BLACK AND WHITE DUCK. (Le Canard noir et blanc.) This is the *EIDER* in Edwards. See this word.

THE NORTH DUCK, (Le Canard du nord,) *long-billed Scoter*.

THE PIED DUCK. (Le Canard pie.) (*Anas labradoria*, Lath.) This species, which in the summer season inhabits only the frozen parts of Labrador, departs from thence when the extreme severity of the cold renders them uninhabitable. At that period, it retires to the states of New York, Connecticut, and New England. It migrates in flocks, and also visits the eastern coast of Cape Fear. Its size is that of the *wild-duck*, and measures about a foot and a half in length; it has a black streak, which descends from the crown of the nape; a rufous hue on the head and neck; a black collar, and a band of

the same colour on the breast; the back, wings, and belly, brown; the scapular feathers white, as also the middle quill-feathers of the wings; the bill blackish, with an orange circle surrounding its base; the legs yellow, and the webs brown.

The female is varied with brown on the upper parts, and whitish beneath; a white spot is to be remarked on the wings; the legs are black.

THE BROWN DUCK. (Le Canard presque brun.) (*Anas fuscens*, Lath.) This duck, which is found in Newfoundland, measures fifteen inches in length; the bill bluish and black at the tip; the head and neck of a very pale brown; the feathers on the back, rump, breast, of the same hue, and edged with yellowish; the wing ash; and the vent blue with a white edge. A very accurate observer, Bosc, one of the compilers of this Dictionary, has brought from South Carolina a *duck*, which differs but little from the preceding one, and which appears to him, if it does not belong to the same species, to be of a very near tribe. This *duck* nestles in Carolina. Its manner of living is much the same as that of the *teal*. It measures fifteen inches in length; the bill of a greenish brown, and very recurvate at the tip; the irides yellow; the eye-lids whitish; the top of the head of a copper-brown; the sides grey; a white spot above the eyes, and near the ears; one brown in front; the feathers of the occiput long; the neck brown at the top, half white, and half grey beneath; the breast brown; and the middle of each feather, towards the tip, of a ferruginous white; the belly grey; and each feather brown in the middle; the back of a greenish brown; the rump and tail brown; and the tips of the quill-feathers whitish; the wings similar to the back; the six first quill-feathers green at the tip, and outwardly edged with silvery white; the secondaries edged with this last colour, and outwardly green, all are ash inside, and the inferior coverts white and brown.

THE ROYAL DUCK (Le Canard royal,) (*Anas regia*, Lath.) is found in Chili; it is much larger than the *tame duck*; it has a kind of red and membranaceous crest growing on its head, hence the denomination that distinguishes this *duck*; it has a fine white collar round the neck; a rich blue covers all the upper parts of the body; beneath is brown.

WILD DUCK. (Canard Sauvage.) (*Anas boschas*, Lath.) fig. of the male and female, col. pl. in *Buffon*, Nos. 776 and

777. In this species, as in every other of the same genus, the male is always larger than the female; the whole length of it is generally twenty-one inches, and that of the bill two inches and a half; he is distinguished by a small bunch of feathers on the rump; he is also adorned with the most beautiful colours, whilst the coat of the female is plain, and of little appearance; a rich emerald green, with waves of polished steel, irradiate the head and the half of the neck of the male; beneath is a small white collar; the rest of the neck, in front and on the sides, is of a beautiful purple brown, as is also the breast; the neck above is striped with blackish on a grey ground, as likewise the back, the flanks, and the body beneath; the rump is of a black, turning to a dark green; the wings are grey, with a broad bar of a fine bright azure, edged above and below, with a narrow bar of a deep, bright velvet-blue, which is again surmounted by another of a white colour; the quill-feathers of the tail, twenty in number, are grey, edged outwardly and tipped with black, except the four middle ones, which are recurvate, and of the same colour as the rump; the bill is of a yellowish green, and the irides of a brown colour; the naked part of the legs, feet and claws are orange, and the front claws blackish; the hind one is reddish. The plumage of the female is varied with brown and rufous grey; she has two transverse bars on the wings, but that which is of a bright azure in the male, is something like violet in the female; her bill is reddish, with black spots on the upper mandible.

There are some varieties in the species of the wild-duck: 1. *The large wild duck*, which the Germans style *gross ente*, *gross wild-ente*, &c. and the Catalans *anch coll vert*; this tribe entirely resembles the common tribe; except that it is rather larger, and that the feathers of its back are of a sooty colour. 2. *The large grey wild duck*, in German *schmael endte*, *schmil endte* and *schmelichen*. It is of an ash colour, and its bill, feet and claws as well as the webs, are black. 3. *The small wild duck*, noticed by Schwenckfeld and which appears to be the *small teal*. 4. *The black wild duck* (*anas nigra* dim. éd Gmel. var. N.) is only black on the head and neck: as for the rest, it is like the common duck. 5. *The large spotted wild duck*, in German, *rosz endte*, *mertz endte* and *grosse wilde ente*, only differs from the common duck in having its back dotted with yellow on a black ground. 6. *The large*

wild duck with a broad collar. This variety noticed by Picot Lapeyrouse is remarkable for its broad white collar at the bottom of the neck; the belly is of the same colour. 7. The *brown wild duck*, another variety seen by Picot Lapeyrouse; it is of a brown fawn colour, uniform and unspotted. 8. The *Journal des Savans* of the 16th November, 1684, mentions a *duck with four wings*; but this appearance of four wings was only owing to an individual accident, by which a part of the quill-feathers of the wings, which usually lay close along the body, where, in this instance, rather removed from it.

The species of the *wild duck* is now parted in two distinct tribes: the one which has preserved its liberty, and the other which man has rendered a captive, which generates in our poultry yards, and constitutes one of the most useful and most numerous tribes of our poultry. That portion of the species remaining free, has every character of independance: it abounds in most parts of the globe, does not dwell long in the same parts; only stays the winter in our countries, returns, and proceeds in vast numbers to northern regions, there to build in those parts the most distant from man. They are very shy birds, they fly high, and they are known by the inclined lines, by the regular triangles formed by the disposition of their troop; they never alight before making many circumvolutions over the spot they have chosen; as if to reconnoitre, and ascertain whether it conceals any enemy; they cautiously alight, and when they swim, it is always at a distance from the water-side. They repose on the water, and they are often seen there with their head under the wing, in the attitude of a bird asleep; but there are always some of the flock on the watch for the safety of the rest, and to give notice when danger is at hand; they are therefore very difficult to be got at, and the shooting of ducks requires as much cunning, craft, and pains, and often as much patience, as any other sport. *Ducks*, like every other swimming bird, in coming out of the water, fly directly upwards, and as they are very heavy, they make a great noise the moment they fly off, and the rustling of their flight betrays them at night, for their habits take place more in the day than at night. They leave the water a half an hour before sun-set, and it is usually in darkness that they travel and feed.

Those seen in day-time, have been forced on the wing

by the fowler, or by birds of prey. They migrate in numerous flocks, and are mostly gregarious; they subsist on small fish, frogs, aquatic insects, and seed of marshy places; when the frost sets in, they repair to the borders of forests and pick up acorns, which they are very fond of: they attack the corn-fields. When stagnant waters begin to be frozen over, they take up with the rivers still running, or near their head. The severest winters do not hurt them, and they go to the sharpest countries, seeking a cold climate, as soon as ours begin to grow mild; they extend even to the most northern regions of Europe and Asia, in Lapland, Siberia, Spitzberg, Greenland, &c. and all travellers that have penetrated so far, agree in saying that these birds assemble together in prodigious numbers there, and that they cover all the lakes and rivers; their departure, however, from our countries is not general, and there are some left who pass the winter in France, and even in milder countries.

Wild ducks make but one brood a year; they pair as early as the end of February to the beginning of March: it lasts about three weeks, and our fowlers pretend that the time of laying is that of the *blooming of the liverwort*. These birds then cease to live in flocks; they separate: the males look out for mates, and even fight for them; the pairs steal away from each other and keep hid in the high grass and rushes during the greater part of the day, and issue from them at night only. With a voracious disposition, *ducks* are very eager after the act of generation, and the females, in this respect, do not fall short of the males. Every body is acquainted with the singular shape of the male's yard; it turns round like a screw, and at certain times, it appears long and lank, which has made country people think, that the bird, having swallowed a young adder, it had also been seen hung alive at the bottom of the belly.

It is usually in a thick insulated tuft of rushes, in the midst of a pool, that the female lays her eggs, in bending and breaking the rushes, and arranging them in the shape of a nest. She, however, often prefers furze, at a pretty good distance from the water, stacks of hay in the fields, and forked oaks in the forest. The *duck* even sometimes takes up with the deserted nest of the crow or magpie, on very high trees. In whatever place she builds, she lines the inside with the down she plucks

from under her belly. Sixteen eggs are usually found in it, very obtuse, spheroidical, with a white hard shell; and according to Belon's remark, with a red, instead of yellow yolk, as in the eggs of terrestrial birds. Incubation lasts thirty days, and the female alone takes it upon herself: when she leaves her eggs, in order to look for food, she is careful in covering them over with the same down of which she has previously made a thick layer at the bottom of the nest, and when she returns, after a few moments absence, towards the object of her hopes and solicitude, she cautiously approaches it, she alights at a hundred paces distant, and she only repairs to it but by winding motions, which shew her mistrust: but when she once gets to set again, she leaves it with difficulty, and neither the noise nor the approach of man will make her fly away. The cares of the male, during this long and constant incubation, merely consist in keeping on the watch near the nest, in following the female in her short journies which are urged by want, and to defend her from the persecution of other males.

All the young are born in the same day, and^d on the morrow the mother rises from the nest, calls them to the water. But if the nest is too high, or at too great a distance from the water, the mother and the father take them by the bill and carry them to the water. This fact, reported by Belon, (*Nature des Oiseaux*, page 160), has been ascertained by excellent observers. When once out of the nest, the young ones never return again to it; in the evening, the mother calls them around her in the rushes, and keeps them warm under her wings. The whole day, they swim with great facility, and watch, on the surface of the water and on the herbs, for small flies and other insects, which they make their first diet. *Ducklings* are for a long time covered with a yellowish down; their feathers, and especially the quill-feathers of their wings, shoot but very late, and it is not much before three months that they are able to fly. They are, in this state, named *hallebrans* (*young wild ducks*) as for the rest, they, in six months, come to the whole of their size and all their colours. If *hallebrans* are caught, they are only to be tamed by singeing the tip of the wings, which is a long time in growing again, and by putting them with several tame young ducks.

These birds are subject to an almost sudden moulting, in which they sometimes lose all the quill-feathers of

the wings in one night. It comes on the males after pairing, and on the females after setting, which appears to shew that this sudden moulting is the effect of the strength being exhausted.

The note of the *duck* is loud and rough, and this sound is owing to the structure of the wind-pipe, which, before it divides into two branches to enter the lungs, is dilated into a kind of bony and cartilaginous vase. This wide part of the wind-pipe has been observed to be more lengthened in the *tame duck* than in the *wild duck*. The Latins had the word *tetrinire* to express the cry of the *duck*: we have none such in our tongue, without it is that of *kankan*, which is the very expression of this cry. The females make much more noise, their voice is louder, more susceptible of inflexions, and they are more loquacious than the males, whose voice is much weaker, monotonous and hoarse.

The species of the *wild duck* is to be found in the northern regions of the new world, where it follows the same order in migration as in the old. But the *ducks* that stock the sides of rivers, lakes, and the meadows laid under water in South America, do not belong to this species. They are a different species, which we are describing under this head.

Of all the peculiar qualities which the ancients ascribed to the different parts of the *wild duck*, there is none undeniably proved but the excellency of their flesh, finer, more succulent, and better tasted than that of the *tame duck*. It is a dish sought after by the best tables: and the duck-pies of Amiens are held in great estimation by the gluttons. There has, therefore, been a variety of means contrived to catch *wild ducks*; and there is no country, no canton even, resorted to by these birds, where some peculiar mode is not in use for catching or killing them. It would require a volume to give an account of all these methods, and we shall merely point out the plainest, and at the same time, the surest. We shall prefix to this account of *duck-hunting*, some particulars which no glutton should be ignorant of.

In order to distinguish young *ducks* from old, the claws must be examined, which the old ones have smoother and of a deeper red; or else a quill-feather should be plucked from the wing, whose tip will be soft and bloody if the *duck* is young. The difference between

the *wild duck* and the *tame duck* is very obvious: the first has more elegant forms and contours, the scales on the feet finer, more equal and glossy; the webs of the claws thinner, the nails sharper and more shining, and the legs more slender. It is also easily known, when served up on our tables, by its stomach always rounded, whereas the part sticks out sharp in the *tame duck*, although the latter be overloaded with much more fat than the wild one.

Duck-Hunting.

With loops Of all hunts after *ducks*, the plainest, and at the same time the least expensive, and one of the most profitable, is that termed *glanée*.—For this sport, one must have flat tiles, the largest of those used for the tiling houses: a hole bored through the middle, through which are run four iron wires of a middling thickness and a foot long; they are twisted, and bent round at each end, and a noose of six or eight horse-hairs is securely fastened to each. The top of the tile is laid over with clay, and corn boiled in plain water is strewed over this; corn is also strewed around the snare to serve as a bait. This sport must be done so privately, that one duck may be taken by the side of its mate, without perceiving or suspecting the snare, which is laid by the side of a river, pond, marshes, or in meadows laid under water, so that the tile is covered with four inches water at least, it being indifferent whether the nooses float horizontally on the water. *Ducks* are soon caught at it, in diving to eat the boiled corn which serves for the bait and without being able to extricate themselves. To prevent the *duck*, when being caught, from putting the nest out of order, several are tied after the same string, which is run underneath, through the rings that have been formed with the wires that secure the nooses: in which case the snares are laid at a certain distance one from another, and different sorts of water-fowl are caught with them.

With nippers. On the same spot where the snare just described has been placed, a kind of nippers may be laid, which are named *elvaski*, from the name of the inventor. This instrument resembles on a large scale that used by German smokers to lay hold of hot cinders to light their pipes. The nippers, in letting go by means of a spring, catch the *duck* by the feet or by the neck.

With a fowling piece. In summer, where there is in a pond a covey of *hallebrans*, or very young wild ducks, or where they begin to hover over this pond, they are sure to be met with, very early in the morning and towards noon, dabbling on the margin, in the high weeds, where they let one come very near before one fires. They may likewise be pursued on the pond at all hours in the day, by getting into a boat, which affords very good sport, especially on small ponds, where it is an easy matter to kill them every one; because they stray the less from one another, and are not lost sight of; this is easier still if the mother happens to be killed; a *tame duck* is then taken, which is tied by one leg with a pack-thread to a stake, fixed on the water-side; the fowler steps aside, and the *duck* begins to *quack*, and as soon as the *hallebrans* hear her, they make up to her directly, taking her for their mother; they are then shot at. If one wishes to have them without firing, one throws in the water, around the place where the *duck* is, hooks baited with calf's pluck, kernels, small fish, frogs and even little bits of flesh or worms; these hooks are fastened to packthreads secured to stakes drove near the side of the pond.

There is scarcely any pond, that is not frequented by flocks of *wild ducks* from the beginning of the autumn: where these ponds are of no great extent, two fowlers, placed one on one side, and the other opposite, by throwing stones in the rushes, start the game which they shoot, and of which they kill a certain quantity, especially where the pond is not very broad, and grows narrow towards one end; but the surest way is to be rowed in a boat up the pond, to penetrate softly into the rushes: in this manner *ducks* suffer themselves to be approached near enough to be shot on taking flight; those who escape return in a few moments after, and again alight on the pond, and with the same precautions one may make sure of more; but one must not be in a hurry to shoot as soon as it is deemed possible. The *duck*, in rising up, does not fly at the rate as a bird that flies forward, and one has just as much time to take aim at a *duck* that springs at sixty paces distance, as a partridge that springs at thirty.

On the catch. In winter, and especially in frosty weather, *ducks* circulate and are more in motion than at any other time: they are then watched for at dusk, and are shot in flight or in alighting: when the ponds

and rivers are frozen over, the fowler is on the cat^t, near the heads of rivers or fountains which are not frozen.

With the hut. The sport *with the hut* is that which destroys most *ducks*. The *hut* is a small cottage very low, and which will only admit one or two people; it is built in a marsh, with willow branches, covered over with earth and turfs of grass. It is usually set up in a place where the earth forms a hollow, and whither the water of some neighbouring ditch is conveyed, that forms a small pool of from fifty to sixty feet in diameter, at the extremity of which is the hut, which must be advanced a few paces into the water, and on ground high enough to keep it on dry land. The *decoy-man* is provided with two or three decoys, a *drake*, and two or three *tame ducks*, which are set in the water at some distance from the water-side, and which are tied by the legs, with a packthread two or three feet long, to stakes which do not exceed the surface of the water. The *decoy-man* has boots for this purpose, as also to reach the hut; he is attended by a water spaniel to go and fetch the *ducks* which are killed. He waits for the *ducks*, and other water-fowl, which are enticed by the voice of the *decoys*, coming on the pool, when he shoots them dead through the loop holes made in the hut.

Where *live decoys* are not to be had, *ducks* may be imitated, either in stained wood or in earth. This sport lasts from the beginning of November to the end of March, and only takes place at night, except in the first frosty or thawing days. It is also practised on the banks of rivers, where standing waters are, and instead of a hut one may sometimes get into the hollow, which sometimes occurs on the steep banks of a river; and from hence, with large bored pieces, from ten to fifteen *ducks* may be killed at one fire; another thing very much like that just described, is that practised on pools at a league or two distance from the sea, and whose extent is usually of a half an acre; at six or eight feet distance from the edge is a small island, either natural or made by a removal of earth, covered over with a wood of reeds or shoots of willow or osier: in the midst of this isle is a small very low thatched cottage. In order to induce the *ducks* and other water fowl to come down to the pool, the fowler fastens one or two *tame ducks* to the edge, and he has, besides, in the hut, a *male duck*, which he lets loose in the air as soon as he perceives a flight of *wild ducks*,

the tame *duck* joins these, allures them to the pool, and he has the peculiar instinct of separating from them as soon as he is in the water, so that he may not be killed along with them. At the close, and before the break of day, these are the most favourable opportunities for this sport.

Besides these different manners of shooting birds in ambush, there are many others which localities point out, and which may be easily thought of in pursuance of the principles laid down in the different sports I have just laid before the reader.

By candle-light. 'Tis thus that at night, on a slow river, a fowler placed in a boat, which he lets go with the stream, and in the front of which is a perch laid in a horizontal direction, at the end of which is fastened a terrine full of tallow, with three lighted wicks; the *ducks* are enticed from the river-side, to the part which is lighted, and they are killed with long fowling-pieces called *duck-guns*, and which carry very far; the same advantage may be obtained, if, when two fowlers are following at night, the margins of a river that is frequented by *wild ducks*, one of them carrying a well scoured kettle, in which the terrine is placed.

With nets. On the sea side, when the *ducks* issue from it towards night, or when they return to it at the dawn of day, they are not only killed in flight, by fowlers concealed in huts, but they are likewise hunted like other water-fowl, in a manner that is still more sure and productive: it consists in laying, at low water, and at two hundred paces from the water-side, three meshed nets which are placed in a vertical manner, by the help of perches raised higher than the surface of the water; when these birds are driven by high water, or by forced winds, they take to these nets and are caught.

With lark's nets. In marshes, in ponds, where the edges are not very deep, and in meadows underlaid with water by the overflowing of rivers, many *ducks* are caught with lark's nets, which are laid in the same manner as for larks. The difference necessitated by localities is, that iron bars are used to raise and fix the net, on the bottom of the marsh, pond, or inundated meadow, over which it is laid; and that if the nets, are mounted in wood, they are supplied with leaden bullets to make them keep to the bottom; in being particular in placing these nets in a part covered with two feet water, and instead of having

a looking-glass and a lark as a decoy, several tame female *ducks* must be had, which the fowlers tie down between the water-side and the nets, which he keeps at work from the hut which he has set up on the edge, and that by the same process, and under the same circumstances as for the *looking-glass chace*. For the better insuring success in this sport, a few tame male *ducks* are got in the hut, which the fowler lets loose when he perceives a flight of wild ones; the tame ones make up to them, the female decoyers call them back, the tame males obey their call, and are followed by the wild ones, and when the latter are crossing the nets, the holder sets them going, and they are often caught by dozens at a time. If the decoys are wild females, it will be better still. This sport is followed at night only by moon-light, and before the dawn of day, north and north-west winds are the most favourable; every intelligent sportsman will then be acquainted with the alterations required by localities, between the manner of laying lark's nets and duck's nets.

The grand snare. The greatest and most productive sport, is that pursued on the fine pond of Arminvilliers, and which may be followed in other ponds that afford the same facility. On one side of this pond, shaded by reeds, and surrounded with wood, the water forms a creek jetting into the woody place and like a little shady port, where a calm constantly resides; from this port pipes are led up, which penetrate into the midst of the wood, not in a direct line, but bending in and out; the pipes, called *horns*, are pretty wide and deep at the mouth of the creeks, but grow gradually narrower in width, and diminish, in proportion as they run into the wood, where they end, and on dry land. The pipes are, at about half way, covered with a funnel net, at first pretty wide and high, but which draws in closer, in proportion as the canal grows narrow, and ends at the point in a deep noose, which closes like a purse. Such is the grand snare by which numerous flocks of *ducks*, mixed with other wild fowl, are caught as they alight on the pond, as early as the middle of October; but to allure them into the creek, and up the fatal pipes, this is what is done: in the center of the grove and *pipes*, a small house is built, where a person is on the watch, who is named *decoy-man*: this man goes twice a day to throw seed, which more than a hundred, half-wild, half-tame ducks live on, all the year round, and who, swimming all day long in the pool, do

not fail, at the usual hour, and at the sound of the whistle, to press forward and alight on the creek, to wade up the pipes where their food is waiting for them. These are the birds that the *decoy-men* style *decoys*, which, in the season, mixing in the pool with the flocks of wild ones, decoy them up the creek, and then allure them up the pipes, while the *decoy-man*, concealed behind a screen made of reeds or rushes, goes on throwing seed before them in order to bring them right under the mouth of the funnel of the nets; then, shewing himself between the intervals of the hurdles, disposed in an oblique manner, and which till then, concealed him from the fresh *ducks*, he drives those that are advanced under the funnel, and which throw themselves into the purse net: sixty are taken at once in this manner, and thousands in the course of the season. It is not common for the half-tame ones to enter the purse net; they are used to this sport, and return on the pool to begin their manœuvres afresh, and entice a new capture.

See also the article of DUCK, rural and domestic economy.

THE WILD DUCK WITH A RED HEAD. (*Le Canard sauvage à tête roussâtre*), is in Salerne's Ornithology, the *Morillon*. See this word.

THE CAPE WIDGEON. (*Le Canard siffleur du Cap de Bonne esperance*.) (*Anas Capensis*, Lath.) It's size is the same as that of the WIDGEON, a blue mixed with ash, and sprinked with a darker hue, covers the head; the feathers on the back are of a reddish brown, and edged with yellowish, a soft green and blue tint, indicates the wing-shot; an ash-colour is spread over the rest of the plumage; the bill and feet are red, and the nails black.

THE BLACK-TAILED WHISTLING DUCK. (*Le Canard siffleur à queue noire*.) (*Anas melanura*, Lath.) This bird, which Scopoli has first pointed out, but without informing us of the countries it inhabits, agrees much with the *widgeon*. It is not quite so large as the *wild duck*, the top of the head and the back are rufous, the neck and body ash, the rump is varied with white spots on a black ground, the quill-feathers and the wings are of the latter colour; the bill and legs of a red brick colour. (VIELL.)

THE WESTERN DUCK. (*Le Canard Steller*.) (*Anas dispar*. Lath. *Mus. carl. fasc. l. tom. 7, 8. Sparm.*) The name borne by this *duck* is that of the learned traveller who has first made it known. It is in the sands, and

inaccessible rocks of Kamschatka that Steller has discovered it. This species builds there, and never goes from the sea to enter in rivers; it also frequents the most northern coasts of America; its size, gait, and walk, are those of the *little Morillon*; it has on the hind-head a kind of small tuft, two spots of emerald green, the one transverse on the nape, the other, broader, reaches from one eye to the other, in crossing the forehead; the eyes surrounded by small black silky feathers; the bill of this colour; the irides light brown; the front of the neck, the throat, the back, similar to the bill, but with violet shades; a still more splendid collar; the breast lightly tinged with rufous; the rest of the body white; the large quill-feathers of the wings of a glossy brown; the middle ones of a rich mixture of black, blue, and white; the lesser of a violet black on the outer edge, and white on the inner edge; the quill-feathers are pointed and recurvate at the tip; the tail is brown, short, and ends in a point; the legs are black; length fifteen inches and a half.

The female of this superb and rare *duck* is varied only with brown and reddish fawn-colour; its plumage has some resemblance with that of the *snipe*; it has nothing remarkable but two white spots on the wing-coverts, the quill-feathers of which are straight and blackish. It is to this female that the *ferruginous duck* of Gmelin and Latham must be referred. (*Anas ferruginea*.)

THE CINNAMON-COLOURED HEADED DUCK. (Le Canard à tête couleur de cannelle.) (*Anas caryophyllata*, Lath.) This species, which is found in several parts of India, is easily tamed, rarely assembles together in flocks, and lives mostly in pairs. Its size is that of the *black-billed duck*, and is nineteen inches long; the wing-spot not very brilliant, which takes up two or three quill-feathers of the wing, is of a pale red, or rusty colour; the bill, nearly two inches and a half long, is rather curved at the tip, and of a vivid cinnamon colour, as is also the head, and half the neck; a chocolate brown covers the other parts of the neck and the rest of the body; the wing-coverts are long and recurvate; the legs of a blackish grey; and the irides red. The female differs very little from the male.

THE GREY-HEADED DUCK (Le Canard à tête grise) (*Anas spectabilis*, Lath.) is much larger than the *tame duck*, and measures nearly two feet in length; the top of the head of a blackish ash; the sides below the eyes, of a pale green; three small black longitudinal bands on the fore-

head, and which point to the top of the bill, and two others which extend backwards under its angles; the same colour round the eyes; the neck, throat, and breast white; the belly of a blackish brown; the back, scapulars, and rump of this same hue, and with purple shades; the tail-coverts, above and beneath, of a jet black; on each side, above the rump, a large white spot; the quill-feathers of the wings brown; the coverts of a glossy purple, and each feather tipped with a white spot; the tail of a deep brown, and wedged; the bill red; a muscular tubercle, which rises over the bill at its base; the legs of a dirty red.

The female has only a slight swelling on the bill; the eyes surrounded by white; the plumage dotted with brown, black and reddish; the quill-feathers of the tail, and the tips of those of the wings, ash-colour, with a white band running across them above; the legs black. Young males have nearly the same colours as the female.

This species, during the summer season, inhabits the north of Hudson's Bay, and, during the winter, it advances as far as New York. They are found in Kamschatka, Siberia, Norway; and it there subsists on shell-fish, which it dives after to the bottom of the waters, and which it swallows only when it comes up to the surface. Its eggs are whitish; its down is as fine and as soft as that of the *eider*; and its flesh very palatable. These birds are hunted with arrows adapted for killing many other species of water-fowl; they are surprised at the moment they are diving in search of their prey; scared by the cries of the fowlers, they dare not take to the wing, and take refuge under water; but being unable to keep there long, and betraying the part where they are, by the bubbles which they let go, they are struck the moment they shew their head above the surface of the water.

THE LARGE RED-HEADED DUCK. (Le Canard à tête rousse.) It is, in Salerne's Ornithology, the *whistling-duck*, or *widgeon*. See this word. (VIEILL.)

THE JAMAICA SHOVELER (Le Canard varié à calotte noire.) (*Anas Jamaicensis*, Lath.) appears in Jamaica in October and November only. Its size is that of the *little buffel-headed duck*; it measures about fifteen inches in length; its bill is broad, and rather turned up at the tip; the upper mandible is blue along one row of teeth, orange on the sides and round the nostrils; the bottom one is of this last colour; the irides are of a light brown; a black cap covers the top of the head, and a brown hue prevails

on the back, wings, and tail; the throat is white and dotted with black; over all the rest of the plumage, there are bars of a rust and saffron colour, agreeably varied; the tail is cuneated. (VIELL.)

DUCK (*Rural and Domestic Economy.*) We shall here confine ourselves with exhibiting the most essential qualities of *ducks*, and pointing out to farmers, who are desirous of making it their business to rear them, the means of deriving every advantage that can be obtained from it. But before entering into these particulars, we should wish to begin this head by a general reflection, which has most probably been already made by many good farmer's wives, on whom the government of the poultry-yard has naturally devolved.

The *duck*, in a domestic state, is undoubtedly a pretty good resource to the inhabitants of the country; it lives and multiplies in the midst of our habitations, requires little care, even in its first stage; provided it has at hand a river, a pond, a stream of water, a mud-hole, a slough, it is very little concerned which; moisture is its element; it could not answer any where but in cold aquatic places; it would be fruitless to persevere in the desire of bringing up *ducks* in dry and barren places; their flesh would neither be so tender nor so sweet; in this case it is better to take, in preference to these, some other birds to whom the localities are better suited, to come into the views which are in contemplation.

Of the Species and Varieties of Ducks.

In the very great number of varieties of *ducks*, which have been described by naturalists, there usually exist but two or three, at most, in our farm-yards, viz. the *common*, or *dabbling duck*; the *Muscovy duck*; lastly, the *mongrel duck*, which results from the coupling of the *India drake* and the *common duck*.

Wild Duck.

The *wild duck* has produced the *tame duck*, with which it willingly intermixes; it lives in flocks on ponds near inhabited places, and the troop does not alight till it has received the signal of safety, given by those who are foremost like guides; it has a very sagacious scent and ear; it is caught by an hook, with nets laid on large reeds or

rushes. The experienced fowler, placed in opposition to the moon and the wind, can surprise a great number. Its flesh is held in greater estimation than the *tame duck's*. The *wild duck* very often lays on the top of a tree; brings down her young with her bill, and carries them to the neighbouring water; the inhabitants of the North tie, near the large waters, little barrels to trees, putting therein one or two duck's eggs to entice the layers; they visit them in laying, and take away the new-laid eggs, through the bottom, which goes on a swing.

Muscovy Duck.

Naturalists were acquainted with the *Muscovy duck* as early as the sixteenth century. It is so called on account of the musky smell it emits. It is likewise named the *India*, *Guinea*, and *Barbary duck*; but this is not sufficiently diffused, being larger, finer, cleaner, and more quiet, and as good as the *tame duck*. M. Schrenk of Gera, in Upper Bavaria, has followed the rearing of it with the greatest care, and he has committed the result of his experience and his observation, in a private account, which we are now going to give a short extract of.

As this *duck* is still rather shy, it swims as far as it can on the water; and consequently, when it is a river somewhat considerable, it is difficult for it to find its way back to the farm. Ponds and fish-ponds, especially when inclosed with walls, or situated in the corner of a garden, are best suited to it; it is also fond of pools, or places for watering horses, but it must have other objects in view, capable of taking its attention, were it buildings only, because it is not so easily tamed as the *common duck*.

The food it finds in the water or on the ground is insufficient for it. Our economists, therefore, place, on the margins of the waters it frequents, troughs full of oats, swelled up with water poured on them, and soaked crumbs of bread, which agree uncommonly well with it. It is also proper to procure it a sufficient quantity of slime and hog-wash. It falls on it with avidity, even when it has other food in abundance. By attending to these rules, it is useless to tie this bird's wings. It may be depended upon, that it will not fly farther, as long as it finds around it what is necessary for it. But in no instance should the feathers be plucked, or the wings disjointed, because that operation,

which usually takes place on the most essential feathers only, has the most baleful influence over the creature's health.

Dabbling Ducks.

As all *dabbling ducks* are originally produced from the *wild duck's* eggs; and as all are easily domesticated, it seems more natural to distinguish *ducks* into large, middling, and small species. The first is finer in Normandy than in any other part of France.

In Picardy, on the contrary, and in other bordering cantons, the middling species is preferred, better known by the name of *dabbling duck*, because it in fact appears to have still more disposition than the other species for wallowing in miry places, ponds, marches, in which it thrusts its bill to find its food. This species breeds faster, is more lively, requires less care, and has not the fault of leaving the farm for several days together, and of falling, in consequence, a prey to foxes, pole-cats, and other destructive animals.

If the *ducks*, called *dabblers*, intermix with their own species only, those of Barbary, in return, willingly take up with *common ducks*, whence result, by such coupling, mongrels or bastards, which form every variety, superior in size and flavour, which we see in the farms of the different cantons of France.

Mongrel Ducks.

Such are named, in many parts of the south of France, *ducks*, springing from the *India drake* and the *common duck*; the plumage is of a very deep green, and the size a medium between that of the *India duck* and the *common duck*; but they have not those excrescences which distinguish the former; and they almost entirely lose that smell which characterises them. Many observers pretend that the male of this species, being of a very warm complexion, it would never do to give but one female, without which it would be running the risk of having none but clear eggs, of no profit; but these *ducks* being the produce of creatures of different species, they are rarely prolific. Out of one hundred eggs, according to Puymartin's remark, one hardly obtains more than twenty living individuals; but if these *mongrel ducks* breed with difficulty among themselves, they will, by pairing

with common *ducks*, afford an excellent posterity; this is what Olivier de Serres has quaintly expressed in his *Theatre d'Agriculture*, in two paragraphs, which we here give at full length, for fear of altering the text. "A third species of *ducks* comes from the coupling of the *India drake* with the *common duck*; which is to be recommended on account of the fertility of the female, and easy rearing of the young that come from these eggs; one may thus have them in abundance. This *duck* is of the size of the male, is as silent, and has the same good flesh; and of the female it has the fruitfulness of the eggs, which is increased by this marriage, the females laying several times a year; but eggs that are good only to eat, as they will not hatch, on account of the mixture of the seeds, which is barren in generation, (as with mules) their race dies away.

To keep up the stock, one must have a care to add a sufficient number of *India drakes* to the flock of *common ducks*: for instance, one male to five or six females, (as the former cannot serve so many females as the others) in order to have a plenty of eggs, which must be set over, as aforesaid, by the common hens, will answer your purpose. Provided, however, there is no other male but the *India* one, with the flock of common *geese*, for fear of spoiling the whole; and, as far as it can conveniently be done, this flock so sorted out, should be cooped up in a separate place; by which means this bastard tribe will be kept up; whence you will derive agreeable usefulness, by the eggs and flesh it will afford you in abundance.

Of the Duck.

She is in all varieties of *ducks* of a lesser size than the male; her cry is louder and sharper, and her colours are neither so beautiful nor so bright. She is again distinguished by another mark, which is an assemblage of some feathers at the tail, placed round and turned up towards its upper tip.

A single *drake* is enough for eight or ten *ducks*, less will do for the *India drake*, and its young ones are with more difficulty reared; without being less voracious, however; they begin to lay towards the end of February, and continue till the month of May, when they have suf-

ficient food, and are lodged in a place that they are fond of. They must then be closely looked after, for they deposit their eggs wherever they happen to be, in the most shady bye-places, sometimes in the water, very often, even after having concealed them from the eye of the vigilant housewife, they hatch them secretly, and some fine morning bring their new-born family to the farm to ask for food, without requiring any further trouble. It is prudent, when the spring is at hand, to give them food three or four times, but little at a time, and always in places where one wishes them to lay, in placing their nests where they have once laid.

There was for a long time, under my window, a little poultry yard, where ducks, fowls, and pigeons lived in common, one may say, and under the same roof, I have seen a *duck* go up to the laying-nest, to deposit its eggs, as if the hen-house were its own habitation. She appears less timed than other layers.

Of Ducks' Eggs.

The *common duck* could lay from fifty to sixty eggs, one after the other, from the month of March till May, if the sitting did not intervene and interrupt the fowl. They are as nourishing as those of the common fowl, are somewhat larger, and the shell seems smoother and not so thick. Their colour is usually greenish outwardly; there are some of a dull white; the yolk is big, and pretty deep. Boiled soft, the white does not turn milky; it acquires a glucy consistence, has a pale white colour, and a rather fishy taste; but boiled, or in omelets, they are very delicate.

In Picardy, the country-women are very busy in looking after these eggs, with which they make their cakes. As there is among them a sort of emulation to set forth, on particular holidays, their talent in the pastry line, it is no uncommon thing, where a religious feast is at hand, to see them run ten or twelve miles in search of *ducks' eggs*, which they use in preference, because they give a better taste, a finer colour, and do not require so much butter. It is true, if instead of yeast they were only to use the leaven of common dough, their cakes would be more delicate, and would not so soon get dry: we could even add, that the yolks of *ducks' eggs*, beat up with the eggs

of the common hen, would make the omelets more delicate, were it not more economical to keep them for settings, and consume them afterwards in the shape of ducks.

Of Wild Ducks' Eggs.

When there is a possibility of getting *wild ducks'* eggs, it is an easy matter to have them hatched, by entrusting them to a tame duck, or still better to a hen. The nests are found in the rushes, near ponds, rivers, especially in solitary places, in bushes that border on pieces of water frequented by these birds. Nothing is afterwards so easily domesticated as the young ones coming from them; they get accustomed so be in the midst of other tame ducklings, as soon as care has been taken to cut the outward part of one of their wings. Without this precaution they would fly away with *wild ducks*, who habitually make their abode in certain cantons, or who pass in flocks at a fixed time of the year; but when love has united them, they no longer think of leaving a place that has witnessed their first affection.

Wild ducks' eggs being to be had with the greatest ease in certain cantons, has induced Gouffier to propose to economists the renewal, every fifteen or twenty years, of the primitive race of our *ducks*, by again domesticating *wild ducks*; they are infinitely better, and cost less to keep, because being by nature more inclined than our tame ducks to seek their food, they are out all day long, and at all times of the year, seeking their food by the water-side, where they find some suited to their taste and constitution.

The individuals of the first generation are, in truth, rather smaller than our *tame ducks*; but at the second, and especially at the third, they at least prove as large; they have the delicacy of *wild ducks*, and all the goodness and fat of our *dabblers*.

Setting of Ducks.

The *duck* is not naturally disposed to set; it is to induce it so to do, that, towards the end of laying, two or three other eggs are usually left in each nest, being careful every morning to take away the oldest, in order that they may not spoil. From eight eggs to ten are given

her, according as she is able to cover them, taking particular care not to sprinkle them with cold water, as some authors wrongly advise. This precaution, at the best, is superfluous, if it is not even hurtful. To do well, they must, as much as possible, be her own eggs, or at least, these should be in greater plenty than the rest; for it appears that she sets on the eggs of other *ducks* with pain, and out of compliance to her own.

The only time when the *duck* requires some care, is when she sets; as she then cannot go to her food, attention must be paid in placing it before her; but she is content with it, whatever be its quality; it has even been remarked, that when she was too well fed, she did not set well: she must be portioned.

Setting lasts two months, and the first broods are usually the best, because the heat of summer helps much to bring them about: the cold always prevents the last broods from getting strong, and giving *ducks* as stout.

The *duck* is reproached with letting her eggs get cold, when she sets. Yet Reaumur says, he had a duck of the commonest species, which appeared still more uneasy about this cooling to which the eggs were going to be exposed while she was taking food, than hens appeared to be for their's; she only left the nest once a day, towards eight or nine in the morning; and before she left it, she covered them over with a layer of straw, which she drew from the body of the nest, to screen them from the impression of the air. This layer, above an inch thick, secured the eggs so well that it was impossible to guess that they were there.

To be sure, every *duck* of the same species is far from giving the same proofs of so much foresight for the preservation of the warmth of their eggs, as the one we allude to. It often happens that they let them cool. Besides, hardly are the ducklings born, when the mother takes them to the water, where they dabble and eat at first, and many of them perish, if the weather is cold.

All these reasons, and many more, too long to particularize in a work designed to present a great variety of objects, usually induce farmers' wives to have *ducks'* eggs set on by *hens* or *turkey-hens*: milder and more assiduous than *ducks*, these borrowed mothers take an affection for their young, to watch over which requires some share of attention; because, as they are unable to be accompanied to watery places, for which they shew, as

soon as born, the greatest propensity; they follow the hen on dry land, and get a little hardy before they take to the water without any guide.

It is likely, that if a considerable quantity of eggs could be collected together, to make one large brood, the art of hatching chickens in an artificial manner, applied to *ducks*, would be attended with the greatest success, as the latter birds are less difficult to rear than chickens. It would be sufficient to keep them shut up for twelve days in that place called *duck* or *chicken-house*; and where it would be proper to leave a few buckets of water for them to dabble in. At the expiration of this time, they might be set at liberty, and they would get on surprisingly, provided they had a slough, a little ditch in the inclosure where they might be turned in, a small rivulet.

It is said and repeated, that the *duck* refuses to set on her eggs, when she herself has been set over by a borrowed mother; but this is merely notional: the instinct of nature overcomes every thing. I never did perceive any repugnance to the incubation of *ducks*, although originally set over by common *hens* or *turkey-hens*. As soon as the young ones are hatched, they instinctively take to the first neighbouring slough. Dambourney, whose whole life was spent in objects of public utility, thinks he remarked, that, until they are nearly crossed, a brood does not mix, neither on water nor land; each keeps apart, but without fighting, or appearing to hate each other.

Of Ducklings.

They are thirty-one days in hatching, whether the *duck* be entrusted with the care of hatching her own eggs, or whether it be left to the *hen* or the *turkey-hen*. It is possible to rear a great many, and at a small expence, because they run and find a part of their food almost as soon as they are out of the shell.

Ducklings can do without their mother as soon as they are born. Their food, in the first days, is crumbled bread, sopped in milk, and a little wine, or cider. Some days after, a paste is made for them with a bunch of nettle leaves, tender, boiled, chopped up very small, and of a third of the flour of Indian wheat, buck wheat, or barley: stale eggs may be added, being boiled first.

As soon as they have a little strength, a good deal of

pot herbs are given them, raw and chopped up, mixed with a little bran soaked in water, barley, mashed acorns, boiled potatoes beat into pieces; little fish, when they are to be had, equally agree with these birds, who fall foul of the different substances that they meet with, and shew, from their most tender age, a voracity which they keep all their lives.

Ducks are so vivacious, that an egg, broken out of curiosity, or by accident, two or three days before the time of hatching, will afford a duckling, if it is nicely covered over with another shell. I have often seen these piecings done with success.

To strengthen the young ones before they take to the water, they must be secured under coops, during eight or ten days, and having care to put a little water under it, which is an easy matter, when they have had for a setter the *hen* or the *turkey-hen*: they then get hardy on land: by setting them at liberty, a natural propensity soon draws them to the water; they plunge into it. *Hens* being unable to follow them, shew, by cries and moans, which they understand not, their uneasiness and alarm about the adopted family; a state which Rosset has so well delineated in his *Poeme de l'Agriculture*. But they must be gradually accustomed to return home in the evening, to prevent accidents, which might happen to them if they remained at a distance from it.

Further precautions must be taken before the *ducklings* are permitted to go with old *ducks*, for fear the latter should ill-treat them, and food given them like other fowls, always in the same place, and at the same hours, in order that they be there regularly, and not stray. It is requisite to keep them coop'd up under the roofs on purpose for them, and to place these roofs, as far as the situation will allow, near the slough or pit of the farm-yard.

Food for Ducks.

They may be left to themselves a part of the year. They live on grain strewed about the poultry-yard: with these birds nothing is lost; the siftings and sweepings of barns, mealy substances, fermented in the shape of bread, the residue of breweries and boiling-houses, herbage, vegetable roots, fruits; every thing suits them, provided what is given them be rather moist; it even happens, that where water is at hand, that they take and dip their

aliments in themselves. They, therefore, are particularly fond of the boiled potatoe ; and it has been substituted in some parts with profit, to maize and barley. It is on account of this disposition for moisture, that they are fond of being in meadows and pasture-ground, which might easily be covered with those sorts of plants which *ducks* are most fond of.

But it appears, that every thing approaching to flesh or offal is much to their liking, and forwards their growth admirably well. The large, fine species answers so well in the environs of Rouen, on the banks of the Seine, only on account of its being in the power of the keepers to feed them with earth-worms, taken in the meadows, and which are portioned out to them three times a day, under the roofs where they are cooped up separately : this is what makes those early *ducklings* so large, fat, and white, that are seen in the markets in the month of June.

Ducks are so greedy, that they often set about swallowing a whole fish, or a frog, which heats them extremely, if they do not immediately throw it up. Particularly fond of meat, they eat it with avidity, even when it is tainted. Slugs, spiders, toads, garbage, insects, all these substances, in a word, suit their ravenous appetite. They therefore are, of all the birds in the poultry-yard, those that could do the greatest services in a garden, by destroying a quantity of insects, which usually do irreparable damage, did not their voraciousness make one liable to other inconveniences, which must balance this advantage, and make one give it up.

Enemies of the Ducks.

The most dreaded is the fox, to whose incursions the *ducks* are most liable, because they pretty commonly stray from home ; and it cannot be hunted too much to get the country rid of it ; and the *ducks* must be led to water in the morning and brought back in the evening.

Care must be taken that the waters where *ducks* are at liberty to go, contain no leeches, which occasions the loss of the *ducklings*, in sticking to their feet. One may succeed in destroying these leeches by the means of tench and other fish, who feed on them.

The greatest care must likewise be taken to destroy

henbane in every part where the *ducks* are liable to go, as well as any other poultry; these creatures do not fail to eat of this plant, poisonous to most animals, which soon brings on their death.

Fattening of Ducks.

The size of the duck varies infinitely. There are some, which in the course of eight or nine weeks, reckoning from their birth, weigh as much as seven or eight pounds, while others of the same age and species, do not come to half this weight. It is well known, that it is not necessary to caponize them in order to fatten them.

Although this bird values its liberty above every thing else, and, that it has been remarked that it would easily fatten without being cooped up, experience has, however, proved, that this can sooner be attained by putting it under a coop, in giving him a sufficient quantity of grain, or fat bran, and a little water, merely to moisten his bill; else it might drown itself.

In Britain, *ducks* are fatted by means of ground-malt, mixed up with water or milk. In Lower Normandy, where a trade is carried on with them, because the soil is very cool there, a paste is prepared with the flour of buck-wheat, which is made into gobbets, with which they are crammed three times a day, during eight or ten days, after which they are good to sell at a price which indemnifies for the trouble and expence, especially when the proper time is laid hold of to get rid of them.

In Languedoc, when *ducks* are pretty fat, they are cooped up by eight or ten in a dark place. Every morning and evening a maid-servant crosses their wings, and placing them between her knees, she opens their bill with her left hand, and with the right fills their crop with boiled maize. Many *ducks* are suffocated in this operation, but they are not the worse for it, provided care is taken to bleed them at the time. These miserable creatures are for a fortnight in this oppressive and suffocating state, which increases their liver, keeps them always gasping for breath, and nearly unable to breathe, and finally gives them that disease, called *hepatical cachexy*. When the tail of the duck is like a fan, and no longer holds together, it is known to be fat enough: it then is bathed, and afterwards killed.

I opened, says Puymartin, two *ducks*, one of which

had not been stuffed in this manner. The liver of the former was of the common size, the skin equally thick, and the lungs in a perfectly sound state; but the one that had been crammed had an enormous liver, which covering over the inferior part of the belly, extended as far as the anus. (*Ducks* are usually suffocated, when, by the pressure of the liver the anus opens, and the liver appears at the orifice). The lungs were weltering in blood, the skin of the belly that covered the liver, was as thick as a six-pence : *ducks* fed in this abundant manner, are like balls of fat. super

Salting of Ducks.

Two days after killing the fatted *ducks*, they are cut open at the inferior part, and the thighs, wings, and the flesh on the rump and stomach, are all drawn away at once. The whole is put, with the neck and tip of the rump in a salt tub, and there left covered with salt for a fortnight; after which they are cut in four quarters, and they are put in pots, care being taken beforehand to lard them with cloves, and to throw in some spice. A few bay leaves and a little nitre are previously put in the brine, to give the flesh a fine red colour.

Commerce of Ducks.

There are scarcely any nations who do not make a trade of *ducks*. The Chinese, especially, are very clever at rearing them: many live by nothing but this trade. Some buy the eggs, and sell them; others hatch them in ovens, and traffic with the broods: there are some who apply themselves to nothing but the rearing of ducklings.

Some Englishmen, in imitation of these people, have also made it their study to improve this education. Their method consists in keeping a few old *ducks*, and giving up their eggs to be hatched by a *hen*, during eight or ten days only, after which they bury them under horse-dung, taking care to turn them over and over, every twelve hours, till they are hatched.

It is usually from the month of November till February, that they are brought to Paris, plucked and drawn, in order to keep better. The Rouen *duck* used to pay a duty double that of the *dabbling duck*. This difference arose not only from its size, which in fact is

larger, but again, on account of the quality of its flesh, held in estimation; the former is like the fatted barn-door fowl, and the latter like aquatic game.

The *ducks* of the large species are finer in Normandy than in any other canton in France. The English come often to purchase them alive in the environs of Rouen, to enrich their farm-yards, and improve their degenerate or bastard species: they put them in enclosures, in order to afford excessive sport to opulence.

Ducks are therefore a trade for the coasting-captains of that nation, who, in passing to return home, sell them again to rich land-holders, wise enough to reside in their own domain. The profits of exporters depend on fair weather and shortness of the passage, which keeps off, more or less, a mortality among their passengers.

The *India* or *Guinea duck* is indifferent eating, on account of the strong, musky smell which it emits. The rump, being the part where this smell resides, must be taken off, when it is killed: mungrels entirely lose it. It is perhaps this scent which hinders tame *drakes* from pairing with *Muscovy ducks*.

The *wild* or *tame duck*, on the contrary, is an excellent dish; but it must be young, and rather stifled than bled. Farmers, who rear them for the market, are obliged to bleed them before they expose them to sale, because, having a red skin, it would be thought that they had not died a natural death. In several cantons in France, it is the usual dish of people in easy circumstances, and consequently the object of a trade so much the more lucrative, as that every thing agrees with it, that it is liable to no diseases, and that if it moults like other birds of the poultry-yard, this periodical turn is less fatal to it; it often lasts but one night. With the male, it is after pairing, and with the female, after laying; which should make it appear, that moulting is the consequence of being exhausted, at least for these birds. The *duck* is so fond of feathers, that if one has not an eye over her, it plucks whole bunches from the *chickens*. I have seen common *chicks*, whose rumps were stripped of their feathers by these tricks. Care must be taken to prevent her from going near them.

Of Ducks' Feathers.

Ducks again afford another profit in their feathers, if

care has been taken in the months of May and September to pluck them from under the belly, wings, and round the neck, when alive, and before the moulting time. These require to be dried in the oven, when the bread is taken out, and should be done so several times, on account of their oily nature, analogous to that of every other water-fowls' feather.

But if the eggs and flesh of the *duck* are infinitely better than those of the *goose*, its feather is in recompence much inferior in quality: it is, however, pretty elastic, and fetches, generally, a certain price. In Normandy, pillows, mattrasses, and bolsters, are made of it, in mixing it with that of the *goose*. Edderdown, so well known in trade, on account of the precious advantage it unites of being very warm and very light, arises from the down gathered from the male of Iceland *ducks*, of the same genus as the *goose*, and which only differs in being somewhat differently shaded in the plumage. See EIDER.

In fine, the eggs, flesh, feathers, and dung of *ducks* are a pretty good revenue of the poultry-yard to catch the attention of farmers in those cantons where meadows, added to the moisture of the soil, were favourable to the rearing of these birds, and become an essential branch of agricultural industry to these inhabitants.

A place made fit for Duck-house or Pond.

This is the place on purpose for *ducks*; in those parts where they live at liberty, roofs are put up for them on the margin of the water, where they may retire to; fish must then be given up, unless large fish only are kept up; but the place for *ducks* is again more especially covered and prepared in a pond, or marsh, for the catching of *wild ducks*. Its description, and the different methods employed to proceed to this sport, or rather this fishing, are found in Varon and Columella.

Decoy, a hunting term, a place covered and prepared in a pond for catching *wild geese*. Duck-gun is also the name of a large gun, with which one may shoot *ducks* at a great distance, which are very difficult to approach; the carriage of this piece, with a common charge, is of one hundred and fifty paces.

OF THE FOWL.

COCK and HEN. (Poule et Coq.) (*Phasianus Gallus*.)

Lath.) Birds of the genus of the *pheasant*, which have given their name to the gallinaceous kind.— Among every polished nation on earth, and even among nations half-civilized, but united in sedentary societies, there is no country habitation, around which one does not meet with flocks, more or less numerous, of these heavy and perfectly terrestrial birds, which man rears, shelters, and nourishes, and which we call *cocks* and *hens*. The period of their servitude is hidden in the remotest ages of the world ; it is a species which art has almost entirely wrested from nature : fowls are every where seen in a domestic state, and wild ones are scarcely to be found any where : it is not long even since it is positively known where the latter still exist in small quantities.

The acquisition of the fowl species has not, in all probability, been an easy conquest ; though birds of the poultry kind, in general, seldom spring up in the air, and keep mostly on the ground, in search of food, scratching the surface with their feet, and rolling about in the dust ; though their flight is heavy and laborious, which affords a means of making them lose the habit of it, yet these birds are of a shy, wild, disposition, and consequently averse to constraint. To succeed in bringing that of the fowls into a complete bondage, a long series of attempts and cares has doubtless preceded the successes which we now enjoy, without being acquainted with those to whom we are indebted for them. They may be looked upon as a true blessing to humanity. But few species of animals are of so much utility as the species of the fowl. Whether young, adult, old, male, or female, these birds afford light, wholesome, and strengthening food, which is equally suited to those in good health, or to those in a low or convalescent state, which the art of our modern epicures knows how to transform a thousand different ways, and always agreeable, but which is not less good, less succulent, when dressed with temperate plainness. Every one is acquainted with the extraordinary fecundity of our barn-door fowls, and the prodigious consumption made of their eggs. This fecundity, the never failing and varied resource of the rich, as well as the poor man's table, is, in a manner a disparagement in the eyes of the rich man, who is not sparing of sacrifices, where they tend to satisfy his gluttony and his sensuality ; 'tis on the altar of these deities, whose worship and power are very extensive, that *cocks* and *hens* are mutilated, and

that they are offered up after being fattened; they, then, in fact, acquire an exquisite flavour and delicacy. The feathers of the poultry kind is down for the peasant and the working classes in cities. The cock is to the peasant a living clock, whose exactness, to be sure, is not very regular; but is sufficient, nevertheless, to point out the divisions of the day and the night, of labour and rest. Lastly, the dung of fowls is one of the best manures at the disposal of agriculture, but which is only used with discretion, on account of its power and heat. I shall be silent on the numberless dietetical and medicamentous uses which *cocks, hens, pullets* and eggs afford; they are generally known, and the purposes to which they are applied are also generally diffused.

So many useful properties have made the rearing of fowls an art in repute among the ancients, as it still is in our days. The proper masters in this art are the farmers' wives and house-wives, who, accustomed from their infancy to look after the poultry, are acquainted with every particular of rearing, the different processes it requires, and the alterations which circumstances compel to bring forward. More will be learnt by following these intelligent women for some time, than by poring over a multitude of books on economy; it is among them that experience is found allied to a very plain theory, and which does not exhibit any thing vague or unsettled. I had in my service, for more than twenty years, one of those women, so clever in the management of the poultry-yard. Three hundred head of poultry, of all sorts, constantly afforded at my house such a sight of the finest domestic birds, in the best condition, and at the same time of the best sort, which one could not help admiring; but then it were impossible to bestow more pains, and to have more regard, more attention, and I may add, more solicitude and tenderness for them. It is at this school of a daily practice that I have derived all I know relating to that important branch of rural and domestic economy. It would have gratified me in laying down the substance of it in this work, had not one of our co-operators, a modern Olivier de Serres, but more learned than this father of the French agriculture, been in possession of the department for instructing us in the arts and sciences, which are of the utmost concern to us, since they tend to increase and improve our alimentary resources.

My task then goes no further than to pen the natural history of the fowl; and I must stop as soon as art shews itself, as soon as those birds, gathered under the hand of men, come forward. Among the moderns, I am the first that said he had seen fowls in a state of liberty. On my return from a first voyage to Guinea, in 1795, I published a note on the subject of the *wild cock* and *hen*, which I had every reason to think natives of some of the hottest countries of the new continent. See *Journal de Physique*, August, 1775.) In travelling over the gloomy and inextricable forests of Guiana, when the dawn of day began to appear, amidst the immense woods of lofty trees, which fall under the stroke of time only, I had often heard a crowing, similar to that of our *cocks*, but only weaker. The considerable distance which separated me from every inhabited place, could not allow one to think that this crowing was produced by domesticated birds; and the natives of those parts, who were in company with me, assured me that it was the voice of *wild cocks*. Every one of the colony of Cayenne, who have gone very far up the country, give the same account of the fact. Some have met with a few of these *wild fowl*, and I have seen one myself. They have the same forms, the fleshy comb on the head, the gait of our *fowls*, only they are smaller, being hardly larger than the common *pidgeon*; their plumage is brown or rufous.

Some older travellers have spoken before of these *wild fowl* of South America. The Spaniard Acosta, provincial of the Jesuits at Peru, has positively said, that *fowls* existed there before the arrival of his countrymen, and that they were called in the language of the country *talpa*, and their eggs *ponto*. The ancient Mexicans had reduced these small *fowls* to domestication; they called them, as Gemell Carreri informs us, *chiacchialacca*, and he adds, that they were similar to our domestic *fowl*, except that they had brownish feathers, and that they are rather smaller. (*Voyage round the World*) A fresh testimony, that of a traveller who has been all over Dutch Guinea, after me, is again come in support of facts already certain. Captain Stedman has observed, that the natives rear a very small species of *fowls*, whose feathers are ruffled, and which seem to be natives of that country. (*Voyage to Surinam, and in the interior of Guiana*) It is then an indisputable fact, that a tribe of *wild fowl*, very much like our *cocks* and *hens*, exists in the inland parts of South

America. One cannot reasonably suppose, that this tribe springs from birds of the same genus, which Europeans might have transported thither, since they are only met with but very far from any inhabited place; that there is a remarkable difference in the size of these and the *common fowl*: and that, according to the assertion of Acosta, they existed in Peru before the arrival of the Spaniards.

But a learned traveller, to whom ornithology in particular, is indebted for many capital discoveries, M. Sonnerat, has again found the species of the *wild fowl* on the antique land of India, in the mountains of the Gautes, which separate Malabar from Coromandel. I have not been able to procure any individual of the American tribe; more successful than I, M. Sonnerat, has brought home two birds, a male and a female of the Indian tribe; he has published the description of them in his *Travels to the Indies and China*; and he has taken them to be the primitive stock, whence had sprung all the tribes of our domestic fowl.

The male, in this wild tribe, measures from the tip of the bill to that of the tail, two feet four inches; its size is about a third less than that of the common tribe of tame *cocks*; the bill is shaped like a cone, hooked at the tip of the upper part, and is of a horn colour; on the head is a comb of a deep red, flat on the sides, festooned or indented on its edge, and which, springing from the base of the bill, grows larger in going backwards; it adheres to the scull, and waves over the occiput which it laps over, its shape is nearly that of an inverted cone; at the two sides of the upper part of the bill, are placed two membranaceous appendages of the same colour as the comb, and nearly in a triangular shape; the cheeks and the throat on the sides and beneath, are naked and flesh-coloured, as well as a line which extends longways on the crown of the head, between the comb and the eye; below this latter part is seen, on each side, a pearl-coloured spot, of the size and shape of the nail of the little finger; short close feathers, and with webs asunder, form that small patch which covers the ears; the feet are supplied with greyish scales; the spur, of a horny substance, forms a lengthened cone and terminates in a sharp point; the claws and spurs are blackish.

Long, narrow, flat feathers, with webs asunder cover

the top of the head, the front and sides of the neck; they grow longer as they are placed lower, and they wave on the back and the top of the wings, when the neck being bent, is in its natural position. "The quill of these feathers, says M. Sonnerat, is large, swells out, and is discernable in the length of the feather, till within a few lines of the tip; which makes every feather appear longitudinally striped at its center; at the origin, this stripe is grey; in the middle it is black, and a little before the extremity of the tail it grows white. The different hues of the quill in its length, are found again on the webs, but differently disposed. From the root of the feather, till about the third part of its length, the webs are of a dirty whitish grey; in the middle of the feather, at that part where the quill is black, the webs are so likewise on the side of the quill, and their edge is whitish; they are coloured the same beneath, and laterally to that portion of the quill which is white; but what deserves particular attention is, that each feather is terminated in an oblong appearance, rounded on the edges, which forms at the extremity of each feather an oblong glossy spot, whitish, or mostly of a pearl colour, and of a brilliant yellow rufous at the tip. This appendage has the look, the polish, the brilliancy, and the feel of a very thin cartilaginous *lamina*: if, however, it is attentively examined, by raising the feather and looking at it by day-light, this appendage is seen to be bordered in its contour by a fringe composed of the extremity of the webs of the feathers, and that there only results an union of these webs more intimate than it usually is in the common feathers. This structure is the same as that of appendages similar to some wing-feathers of the Bohemian jay. I have found similar appendages to the feathers on the neck of the *Dutch pigeon* of the Isle of France. The undermost part of these feathers, which I have just described, only differs from the top by weaker shades."

The feathers of the back are long, narrow, and terminate in a soft tip; they are crossed longwise by three stripes; the one, which is white, is set in between the two others, which are black; the bottom of the neck in front, the top of the breast, the flanks and legs, are nearly similar to those of the back; on the breast they are of a glossy rufous on the latter third part of their length, and the appearance of the thin cartilage, which is observed at

the tip of the feathers of the neck, is here found again. On the belly beneath, and the tail, there is nothing but down, varied with white, black and grey.

The wings do not come over the root of the tail; they are, at the bend, of the same colour as the back, but streaked with black and white; of a glossy brown rufous at their junction with the body; rufous and something like transversally streaked on the large coverts, and black on the quill-feathers. The tail coverts are long and waving, of a deep sparkling violet, with waves of burnished steel playing over it; the tail is composed of fourteen quill-feathers, which part in two equal plans, inclined one to the other, and which meet at their upper edge under a sharpe angle; the two middle ones, longer than the rest, bend out in a bow, whose convexity is turned to the side of the bird's body.

A size lesser by one third, than that of the *cock*, distinguishes the wild *hen*; she has the top of the head, and the beginning of the neck above, of a greyish hue; the cheeks and the throat covered with very small, very close, whitish feathers; the neck above, the breast and belly brown, striped longwise with white, tinged with rufous; the quill-feathers of the wings blackish on the inner, brownish and dotted with grey on the outer web; those of the tail greyish; lastly, the feet grey. A knob, not very prominent, replaces on the feet of this female the spur of the male.

It is seen, by this description of the wild *cock* and *hen* of India, that these birds differ but little from our domestic *cock* and *hen*. The most striking dissimilarity consists in the wild fowls having no comb on the head, nor fleshy wattles hanging beneath the throat; but this difference is not sufficient to make this tribe be considered as of another species than that of the common fowl, in which as it is known, a very ancient subjugation, removals and multiplication in opposite climates, differences of food, have produced numberless varieties, which, to all appearance, come originally from the *wild fowl of the Gautes*. There grows, besides, among common fowls, and chiefly in the tribe of tufted *fowls*, individuals whose head is without a comb, and the bill beneath without appendages. It is equally very likely that the wild fowl of some desert southern parts of America, is only the same tribe lessened and altered by the influence of the climate. But, it will be said, how can heavy birds, which can hardly fly, be

found on both continents? It might be possible to launch into dissertations of some length on this question. I shall abstain from it, and when the fact is certain, it appears to me to be of little use in searching in this place how it could exist. Do not other genus of heavy birds give instances of this habitation common to both continents? The *quail* is found in our countries and in those of America which border on the equator. There are in the same part many species of *pheasants*; and the *ostrich*, which never flies, is found again, with some restrictions, in Peru, Chili and the land of Magellan.

An assemblage of characters, easily come at, distinguishes the species of fowl, not only from birds of the same genus, but even from all those which compose the gallinaceous order. These are, 1. The red firm comb, which adorns the head, and which, properly speaking, is neither flesh nor membrane; it is a peculiar substance, which gluttons know how to value as a delicate morsel, it garnishes ragouts, tarts, small dishes, &c. Heliogabalus, that ferocious glutton, used to have the crest taken from cocks alive, to eat it. 2. A double wattle of the same colour and nature as the crest, hanging beneath the bill in an oval manner; a tubercle is remarked on its exterior side. These pendants are wanting in the female of the wild race, and it is a kind of exuberance which an abundant food has made it acquire in our poultry-yards. 3. Beyond the corners of the mouth a small fleshy tuberos substance, same colour as the crest. 4. A white skin beneath the ears. 5. The feathers growing two by two out of each quill. 6. The singular shape of the tail. See the foregoing description. 7. The two middle feathers of this tail, much longer than the others in the male, and bowing out in the greater part of their length. 8. The feathers of the neck and rump of the male, long and straight, and his feet armed with spurs.

As to the structure and uses of their digestive organs: their gizzard, or stomach, properly so called, has a very powerful muscular action, and extremely active gastric fluids. Redi, Magalotti, and Reaumur have made experiments which prove the digestive force of the stomach of these birds. In less than four hours, it reduces to an impalpable powder a ball of glass thick enough to bear a weight of about four pounds; in forty-eight hours, it divides longitudinally several glass tubes fourteen lines diameter and one line thick, of which, at the end of that time, all the sharp, cut-

cutting parts are found blunted and the polish destroyed ; it is also capable of flattening tin tubes, and bruising as much as seventeen nuts in the space of twenty-four hours. Spallanzani has carried experiments on this subject to a greater length : he stuck in a leaden bullet twelve large, steel needles, which exceeded the surface of the bullet by three lines. The *fowl* which swallowed this dreadful preparation was not hurt by it, and on opening it, it was seen that the needles had got perfectly rounded, and that the bullet had suffered more than the stomach, since it was scratched on the surface, whereas the viscera was untouched. Another time, Spallanzani substituted to the needles, twelve lancets, whose blades could equally cut and pierce. The creature that was made to swallow them, was no more hurt by it than that of the preceding experiment.

It is not to trituration alone, that the mechanism of the digestion of gallinaceous birds should be attributed ; as Reaumur, Buffon, and other philosophers have thought ; trituration certainly prepares, even hastens, digestion ; but the gastric fluids not only serve to complete it, but can also perform it without any help. Therefore those small stones which gallinaceous birds swallow, do not contribute, as was thought, to the strength of their stomach. The celebrated observer, whom I have just quoted, has ascertained, that those birds, whose ventricle contained a less quantity of small stones, digested as well as the others ; he has even seen that those he had fed, from their emission from the shell, with nothing but grain perfectly well picked, in order to be sure that they had not swallowed a single stone ; he has seen that their stomach was as able to break glass balls as well as those whose viscera contained most of these small stones.

And the inner membrane of the stomach of gallinaceous birds is so hard, that, according to Spallanzani's experiments, if it is detached from the adjacent tunics, and if it is stretched on a glass, it requires some efforts to cut it asunder with sharp instruments. Again : if the entire ventricle is taken away, and then cleaned, and afterwards filled with bits of sharp glass, and rubbed for a few moments between the hands, it will be found that the inner tunic will only have a few scratches, and that notwithstanding the edge of the bits of glass will have begun already to be blunted and rounded,

In *fowls*, as in the other gallinaceous species, the intes-

tinal tube is of a great length ; it is about five times longer than the creature. There are two *cæcums*, about six inches long, which take root at the part where the *colon* joins the *ileon*. The quantity of carbonate of lime, which is daily formed in the *oviductus* of *hens*, is considerable, and it does not appear doubtful, but that this earthly salt is separated by the loins of these birds, and exists in their urine. Vanquelin has observed, that in the laying season, the *hens* which then consume a great quantity of food, void dryish excrements, which are almost entirely destitute of that white chalky matter which usually accompanies the excrements of the *cock*, or of the *hen* that does not lay. This skilful chymist has examined this matter, and has found it to be an albumen dried by the air, insoluble in boiling water, but susceptible of combining with tan. He thinks that the *cock* has, like *hens*, organs susceptible of forming a small quantity of this substance, which being perhaps enveloped sometimes in the paunch, by the calcareous carbonate of the urine, might have given birth to bodies similar to addled eggs, and give credit to the opinion that certain *cocks* lay. (*Bulletin des Sciences*, No. 21, page 164. To these *cocks* eggs, which have got no yolk, and to the existence of which the vulgar cease not to believe, although they are by the learned consigned to the rank of old women's stories, may, indeed, have some reality. How many facts laid down in the writings of the ancients have been rescued from the fabulous empire, whither they had at first been rejected, to be replaced among incontestible truths !

If one wishes to be acquainted with the nature and the inclinations of *fowls*, one is obliged to have recourse to the poultry-yard ; for we know nothing of the habits of *wild fowls* ; but a long bondage has operated such great alterations in the nature of our *fowls*, that it is not easy to come at their original character. For instance, the *tame fowl* makes no nest ; the *wild hen* surely does. The fecundity of the former, is in a manner unbounded, except in the moulting season, it lays almost incessantly ; analogy will not allow us to doubt but that, in the wild tribe, the laying must be considerably confined, and that it takes place only at regular times.

As other gallinaceous birds, the *cock* is a polygamist, that is, he does not keep to one female. A *cock* is repeatedly compared to a Sultan in the midst of his seraglio. But in the eyes of any one who is acquainted

with these mussulmen, whose fierce and sullen pride will have none but slaves, a similar comparison is totally void of propriety. The Sultan ravishes beauty, insulates it in apartments separate from his, shuts it up, torments it by odious and disgusting precautions: the *cock* never leaves his *hens*, follows them in the day, accompanies them in the evening to the common habitation, invites them out, protects them, appeases their quarrels, and never ill-uses them. It is in these women's apartments that the dishes are prepared which load the Sultan's table, and at most times he does not suffer them to share with him. If the *cock* meets with any grain, the smallest worm, he calls his mates, and satisfactorily gives it up to them; he does not touch the food scattered in the poultry-yard by the bounteous hand of the house-wife, before he is positive that his *hens* will be able to have their fill; he does not mind robbing himself, where it can be serviceable to the little troop of friends that surround him. The Sultan deprives himself of nothing, and every thing must bend at his capricious fantastical nod; he commands his enjoyments; beauty enslaved must obey; the least hesitation would be a crime, and the sighs of constraint, the shudderings of repugnance, replace the sweet but thrilling emotions of successful love. The *cock*, on the contrary, endeavours to please, and seems, by his attitude and his motions, to strive to obtain the consent of the object of his desire. There is but one point of exact comparison between the Sultan and the *cock*, which is jealousy; they both experience it to an excess: but its effects are not alike in the one and the other. The former, whose inclinations are ferocious, and whose love is no more than the fury of the senses, immolates to his jealousy the feeble being which force has put into, and keeps in his hands, and who can neither be perjured nor unfaithful: the latter, more generous, only attacks his rival; challenges him, engages him, and in an obstinate duel displays all the resources of valour and vengeance. In a word, the *cock* knows how to please as well as govern at the same time; tyranny and oppression is all the science, as the sure and fatal destiny of the Sultan.

The attitudes of the *cock* are those of haughtiness; he carries his head high; his look is bold and quick; his gait is grave; all his motions bespeak a noble assurance; he seems to reign over the other inhabitants of the poultry-yard. His activity is indefatigable, and he is never

deficient in vigilance. Incessantly taken up with his mates, he warns them of danger, gets before them to defend them, and if obliged to yield to force which robs him of one, he, for a long time, expresses by loud outcries, his anger and his regrets; feeling for their sufferings, he again utters long and sonorous exclamations, when by their cries they announce the pains or fatigues of laying. A softer clucking is the signal by which he calls them; his usual shrill crow is, at the same time, the expression of his continual vigilance, the cry of victory after an engagement, and the accent of satisfied love. It was formerly thought, that the *cock* and the *nightingale* were the only day-birds that sung and crowed at night; other species also warble after sun-set, but all, as well as the *nightingale*, are quiet when the season of love is over; whereas the *tame cock* crows every day and every night throughout its whole existence. However, there is some ground to presume, that it is otherwise in a state of nature, and that the crowing of the *wild cock* is no more, as with other birds, than the momentary accent of his loves.

Ardent and full of vigour, the *cock* multiplies his enjoyments; vehement in his desires, he is not long in exhausting himself by indulging in them. The moment he has made choice of a *hen*, he comes up to her with an oblique and quick pace, his eyes on fire, the wings hanging down on the sides and stiffened, the tail half spread, and uttering a grave sound, a hollow, but lively, murmur; he catches hold of the *hen* by the comb, or the feathers of the head, she squats down, he leaps on her, bends the hind parts of his body, while the *hen* performs an opposite motion; his double organ, concealed inwardly, lengthens out towards the only orifice which the female presents, and comes sharply in contact with it; an instant is sufficient for this act; the shortness of which is doubtless compensated by the activity of the sensations; he rises up, shakes his wings, flaps his sides with them, and sings his pleasures, while the *hen*, after bristling up her feathers, and shaking them, remains silent, and again mixes with her companions.

If the life of the domestic *cock* is an uninterrupted series of enjoyments, it is also commonly a continual scene of war. As soon as a rival comes forward, the fight begins, and only ends by the retreat of one of the champions. Sometimes both rivals die in the battle. If one of them be conqueror, he immediately celebrates

his triumph by repeated crowings and by flapping his wings. The other disappears, abashed at being defeated. With them too, as Pliny says, empire is the reward of victory. "Men, who avail themselves of every thing for their amusement, have known well how to put in motion this invincible antipathy of one *cock* to another: they have promoted this innate hatred with so much art, that the combats of two barn-door fowls have proved sights worthy of exciting the curiosity of nations--of polished nations even, and at the same time means of bringing to light, unfolding, and cherishing in the mind that precious ferocity, which is said to be the bud of heroism. One has seen, one may still see every day, in more countries than one, men of all degrees flock to these grotesque tournaments; divide in two parties, each party grow warm for their champion, join the fury of immoderate bettings to the interest of so fine a sight, and the last peck of the conquering bird, overturn the fortunes of many families." (*Buffon's Natural of the Cock.*)

However whimsical similar amusements may be, which supposes in the spectators a certain stamp of hard-heartedness, they are far from attaining the barbarity of sports still more in force in a great number of our villages. On holidays a live cock is tied to a stake; young people, placed at some distance, and provided with stones, boast who shall be most expert in knocking down the hapless bird, which often spends half a day in thus being the butt of the most violent blows before it dies; its long sufferings only irritate the actors of these scenes of barbarity; they all redouble their efforts to win the prize, that is, the *cock* himself, expired under the last blow. I do not know whether I am mistaken, but it appears to me, that similar sports, which are in fact nothing more than wickedness and insensibility put in motion, call for the animadversion of the laws. In a well-regulated society no one should be allowed to be mischievous nor cruel; inhumanity towards beasts soon brings on harshness and violence towards men, and one hardened, brutal habit has more influence than is commonly thought on social order and the fate of empires.

In the mythology of the ancients, the *cock* was the symbol of vigilance. Polytheism consecrated it to Minerva and Mercury; it was offered up to Esculapius, the god of medicine, on recovering from illness. The Romans used to keep sacred pullets, and they undertook nothing

of consequence before they had consulted the auspices of this prophetic *fowl*. Its meals were solemn omens which regulated the conduct of the senate and the armies.

Less spirited than the males, *hens* are also milder and more timid. Their voice is less sonorous ; but its different modulations shew that they, as well as *cocks*, have a varied language, after having laid, they utter loud cries ; if they call their chickens together, it is by a short, grave clucking ; they warn them of danger by a monotonous and lengthened cry, which they repeat till the bird of prey is out of sight ; in fine, they keep up between themselves a continual cackling, which seems to be a coherent conversation between these very chattering females. There are some *hens* which faintly imitate the crowing of the *cock* ; they are usually the young ones of the year, and they do not always keep on this mimic fancy, as I have ascertained by following several of those crowing *hens*, which happened to be at different times in my poultry-yard. As to the rest, they had none of those exterior characters which could bring them near the *cock* ; they lay like the rest, and it is wrong that they should be generally proscribed, either as barren, or as an ill omen. The house-wives of Lorraine, and several other parts of France, are forward in putting to death every *hen* that imitates the crowing of the *cock*, which, in their eyes, is the effect of a charm ; hence a very jocular saying, in which there is some meaning ; *a hen that crows, a parson that dances, a woman that talks Latin, never come to any good*.

In this species of the *poultry kind*, incubation lasts twenty days. After hatching her eggs, with remarkable assiduity, the *hen* leads her little ones with every sign of tenderness and earnest solicitude. She warms them under her wings, which she throws out from her body as much as she can, as she stands half stooping, for fear of hurting her children. However troublesome this attitude may be, the mother bears it with constancy. You may now and then see the *chicks* at play under this soft, warm arch, which their mother makes for them, thrust their little heads between her feathers, and look out as through a casement.

To whatever part the protecting hand of man has transported and taken care of the *fowl* species, it has succeeded. Its food consists of several sorts of grain, fruits, insects, and worms. A good way to rid the gardens of

caterpillars, worms, and other little creatures, that eat away its productions, would be to let in *hens*, if by their habit of scratching the ground, they did not cause by themselves more damage than service. Dressed, or raw flesh, that which gets tainted even, is likewise suited to the taste of these birds, which are fond of feeding on more loathsome things. They are very fond of mulberries, and especially white mulberries; hence one might, with good probability, infer, that the natal place of mulberries was that of *fowls*. Olivier de Serres recommends the planting of a few of these trees in the poultry-yard; but I find that I am going beyond my prescribed bounds, and that every thing that relates to economy is reserved for a more skilful hand than mine.

HEN. (*Economy.*) It is the female of a genus of domestic birds, very varied, extremely multiplied in every part of the globe, and which affords the most of alimentary resources, as much by the excellent eggs which it yields in abundance, as by the fine flavoured and delicate flesh of all the individuals composing the family. They are known under the names of *cock* and *virgin cock*, *hen*, *chicken*, *pullet*, *hen-pullet*, *capon*, *hen-capon*. We are going to speak of them successively, when we have pointed out the place where the old ones repair to pass the night in roosts, and where the laying usually takes place.

Hen-House.

It is well known that cold benumbs *fowls*, retards and diminishes their laying; that a too intense heat weakens them; that the want of good water gives them the pip, costiveness, and other inflammatory diseases; in fine, an infectious atmosphere makes them drooping, whence it naturally follows, that their fecundity is less, that the flesh is not of so good a quality, that the rearing of them is difficult. Under such circumstances one may judge how important it is, for the improvement of poultry, that it should be wholesomely, comfortably, and cleanly housed.

To center every advantage that can be wished for in a *hen-house*, it is then essential that it be neither too cold in winter, nor too warm in summer; the *fowls* must take a liking to it, and not be tempted to go to rest and lay any where else. Its size must be proportioned to the number of individuals, but sooner smaller than too large, because in winter *fowls* electrify, and impart their own

warmth to each other. Let it not be feared, that in being so confined, they will hurt and infect one another. It is proved, that *fowls* which wander about are not very fruitful; and that the closer they are confined, the more ardour they experience in laying, in cold weather even.

The best *hen-house* is situate to the east, rather near, but not too much so, to the farmer's house; it is a square of 12 feet in length by 10 in width, and as much in height; it is raised one foot from the ground; the walls are thick, well plastered, and white-washed inside and out, having neither chinks nor crevices, nor cavities, which leave room for martins, weazels, rats, and mice, and even insects to get in, and to remain there; the roof that covers it juts out very much; shelters it from wet, the most dreadful scourge of *fowls*; the door is small; above it is an opening, by which the *fowls* come in from without, by the help of a ladder, and go and place themselves on the roost, which is purposely fixed on a level with this opening, as well as two windows of a circular shape; the one to the east, the other to the west; both supplied with a very close netted grating, and an outside shutter.

These windows, which serve to keep up drafts of air, which sweeten the *hen-house*, and especially keep them dry, are left constantly open in summer, and shut close in winter.

In the inner angles, the roosting bars are placed on little anvils, and at ten or twelve inches distance from each other; they are perches which must be squared, because the fowls could not grasp a round perch, neither could they bend their claws, their nails, nor keep steady on them.

The intermediate spaces are left for the laying-nests, all covered over with a board, to shelter the layers from the dung of the other fowls, and procure that rest they seek for in the instant of laying.

The laying-nests are wicker baskets fixed solid against the wall; they are well stuffed, often recruited with rye straw bruised, and so nicely adjusted, that the *hens* may enter them without the risk of breaking the eggs contained therein.

It contains a water-pot, similar to that in aviaries, in which fresh water is always kept to sweeten this *hen-house*; the fumigation of aromatic plants are no longer in use, such as incense, benjoin, &c. of which agriculturists have formerly given so many various receipts; be-

cause we have learnt by experience, that these fumigations are hurtful to the fowls in many instances; that they in general did not purify, that they only aromatise putrid miasms. Nothing is employed but fire, air, and water; these three agents are sufficiently powerful and active to produce the best effects.

Therefore, after the hens are gone out, the door and window of the *hen-house* is opened, and a small truss of hay is now then burned in it, for the better renewal of the air and destroying insects. The baskets of the nests, the perches, the troughs, the water-pots, &c. are scraped and washed in cold water, and sometimes even in boiling water, mixed with a little vinegar. The ground, paved with flat or polished stones, or with good pantiles, is frequently swept, scraped, washed, and covered over with a layer of gravel, or straw chopped small.

The same *hen-house* should only be for *cocks*, *hens* and *pullets*; other places must be had for the other birds of the poultry-yard; *fowls*, which consent to live with them in the day time on the same dunghill, do not like to be with them during the night under the same roof; they neither like to have *capons* in their roost, although of the family. These degraded beings, which ought to find nothing but indifference in *cocks* and *hens*, inspire them with the greatest aversion.

It is necessary that there should be some very warm closets adjoining the *hen-house*, as well to having eggs hatched, as for putting in the chickens arising therefrom.

In the coop on purpose for the chickens, are separate pens, where each mother remains eight days with her family, from thence they go into a close, till having completed their education, she may without danger leave them to themselves.

The appurtenances of a *hen-house* are:

1. A small pit filled with sand and ashes; the fowls like to be in it in summer, to get rid of the vermin which gnaw them.

2. Another small pit containing horse-dung, which is often renewed, and which they amuse themselves in scratching in cold weather after grain and worms.

3. Two square grass plats, which are successively given up to them, to feed and divert themselves on.

4. Very thick hedges, or still better, trees that can afford them shelter against the heat of the sun, and hide them

from the piercing eye of the kite soaring high in the air. These trees are usually mulberry or cherry-trees, the fruit of which they are particularly fond of.

5. A shed, where they can be sheltered in rainy weather.

6. Stone or wood troughs, covered over, in which the fowls, by putting their head through the openings made on purpose, may drink clear water, rather than go and drink that which is foul, and liable to give them various diseases.

7. Lastly, the *poultry-yard* that contains the *hen-house*, and all the appurtenances as above pointed out, is extensive, spacious, clean, as much as possible. The dunghills are swept up with care; the water is sufficiently drained off. The numerous and great variety of poultry which inhabit it, finds abundance of every thing, seems not to regret its liberty.

Of the Girl of the Poultry-Yard.

It is not enough to get the poultry wholesomely and comfortably housed, it must have an active guardian, which likewise preserves it from all enemies, and puts in a condition of procuring every advantage to the farm which it has a right to expect from it.

Hens, though easily scared by the least strange animal, get willingly used to every body belonging to the farm; they are not afraid of coming to feed with all the other animals, even in their troughs and mangers; they would even sit at their master's table, if it was allowed them.

But faithful to the house that feeds them, and not content with daily enriching it with their eggs, they never stray from it; so that on perceiving a *hen*, the traveller in search of a habitation, is certain that one is at hand: in truth, as they are voracious, gluttonous, and unsteady, they must be watched and confined.

In farms somewhat extensive, the farmer's wife always has a secondary agent, on whom she can safely depend for all the minute and numerous particulars which the management of fowls require: this agent is what is named the *keeper*, or *girl of the poultry-yard*. To acquit herself properly of this employ, she must be cleanly, careful, mild, patient, clever, attentive and vigilant; when all these conditions are combined in her, she is a perfect treasure, every thing must be done to preserve her.

Her first duty in coming into office, is to try to get beloved by the fowl tribe, the management of which is entrusted to her ; to come often among the individuals which compose it, to maintain peace among them, settle their quarrels, to get acquainted with the peculiar disposition of each, to distinguish those that are not so shy, by speaking to them in a language which they understand, by feeding them in her hand, by evincing her affection for them by caressing gestures. How many peevish *hens* have been condemned to bleed before the proper time under the knife of the cook, which would have lost their cross disposition and have become sociable, had they in their first stage met with more good will on the part of the mistress, and a more caressing tone on the part of the keeper. No one, except the *keeper*, whom the fowls know, and the voice and sight of whom rejoices them, must go into the *hen-house*, for fear of scaring or disturbing the *hens* busied in laying. The inconvenience would be still greater were a stranger to go and disturb them when they are setting or tending their *chickens*.

After these first cares, there are daily ones for their food and drink, which must be constantly distributed at regular hours, for shutting them up in the evening in the *hen-house*, for turning them out early in the morning, to proportion their number to the means of subsistence which exist without much expense, means which are necessarily more easy and more abundant in corn countries, than in vineyard plots. It is, moreover, necessary to tell them over often, to know whether the flock is complete ; to attend now and then at their meal times, to judge of their appetite ; to examine whether they are in good condition, whether they do not get too fat or too lean ; to follow their steps, to watch their actions, and to use them in consequence. to take advantage of their disposition for laying or setting. The new progeny designed for the new stocking the poultry-yard, ought never to be admitted to the *hen-house* but in the evening ; but when a *cock* falling off is to be replaced, the keeper, after having tied the feet of the new comer, must hold him out to the *hens*, and at each time she must so manage it as to hinder the other *cocks* from insulting him. It is at the end of a few days only that the latter have no objection to his becoming their equal, and the *hens* none to acknowledge him as their sultan.

Another attention of the keeper, is now and then to visit the nests where the *hens* lay, to supply them sufficiently with soft and dry straw; to take up the eggs as fast as they are laid; to carry them into a dry, cool, dark place; to separate those that are to be sold or consumed from those that are intended for setting, and to never put them under the *hen* without having examined them by candle-light, to know whether they be fecundated and of what sex the bird that is forthcoming will be, and not to forget to enter in a book the day the *hen* adopts them, in order to have the precise time when they are to be born, and to be able to give the necessary attendance to the last moments of incubation.

The *hen* sometimes experiences a difficulty in laying. In this instance, a few grains of salt put into the anus has been successfully attempted; oftentimes a little garlick; the keeper, should, indeed, make use of the latter mode to find out the place where she has laid without her knowledge. As she is then in haste to deposit her egg, her pace towards the nest is quickened; she is followed, and her secret is soon found out.

Although thirst is with the setter more imperious than hunger, it often happens that she constantly remains on her eggs for twice four and twenty hours without eating or drinking. When the keeper perceives this obstinacy, she must take her up and determine her to eat her victuals, but it is in this instance only; for she had better rise up and set herself on her eggs, as also to leave exclusively to her the care of turning them.

But it is especially on the day that the chicks are to be hatched, that it is necessary that the keeper should pay particular attention, either to assist their emission, or to strengthen them when they are come out of the shell; or in fine, to the care they require during the whole time they live under the tuition of the mother.

It is proper that she should be acquainted with every thing which relates to the operation that caponises them; with the best processes for fattening them; that she should know how to distinguish the food which overheats them from that which cools them; also that which is most profitable and least expensive; that she should put aside each individual as soon as she perceives its plumage bristled up, disordered, its wings hanging or dragging; that she should be tho-

roughly acquainted with all the symptoms of the several diseases, in order to apply the most efficacious remedies in time.

She must know then, 1. That raisin stones stop the laying of *hens*, and that during which time their use must be forbad them.

2. That very nourishing and slightly salted food are favourable to it.

3. That the pip giving notice that the *hens* have experienced a dearth of water or have drank some foul, she must, after making them undergo the operation which is proper in this case, pay attention in giving them always plenty of good water, being careful to let them have it luke-warm in winter.

4. That in a looseness occasioned by too moist food, she must give them that which is dry and rather astringent.

5. That in costiveness, it is useful to employ loosening food, such as beetroot, lettuce, &c.

6. That in the itch, or other disease of the skin, it is good to cool them with pot-herbs chopped up and mixed with bran soaked in water.

7. That when they have the gout, she is warned to take more care of the *hen-house*.

8. That when the shells of the eggs are rather soft, it is because they are rather inclined to turn to fat. It is then proper to diminish their portion; it is also proper to mix up a little chalk in their water and to put a little brick-dust in their victuals.

9. In fine, that she must avoid giving them paste of bitter almonds destitute of oil, bitter almonds being poison to them.

Of the Cock.

The *cock* is remarkable for his haughty, grave, stately gait, for his courage and his vigilance, for his attachment to his mates, for his amorous disposition, and his means of satisfying it.

His head is surmounted with a fleshy, indented comb, often shaped like a crown, of a coral red; under his bill hang two membraneous nipped appendages of the same colour as the comb; his ears are white; his thighs are fleshy; his feet are armed with long spurs; his plumage is varied; his tail is vertical and adorned with fourteen

large, handsome feathers, two of which, much longer than the rest, arch out; his note is shrill, he draws it from the extremity of the wind-pipe; he employs it in the same key, as much for announcing his victories and his good success in his amours, as for every hour of the night, as for the break of day. But he alters it when he invites his *hens* to partake of the meal just served out to them, or calls them to offer them generously the seed he himself has found; but it is again different when he joins his *hens*, as they express by their cries, their joy or grief, and lastly, when he wants to inform them of the dangers that threaten them, or make them share his uneasiness, his alarms, or his desires.

A *cock* is much more than sufficient for fifteen or twenty *hens*, since he can give as much as fifty times a day the marks of his vigour; it is in the morning especially that he is urged to satisfy his passion. He gets out of the *hen-house* first, he sees his *hens* come out; one would think he was busied in counting them; when they are all out, he walks through their ranks, his eyes on fire, and, as if uncertain which choice he must make; he soon salutes one by the wing and the voice, in strutting half-way round her.

At other times, the *cock* avails himself of the discovery he has just made of a grain of seed. He calls his *hens*, the one which at that moment is probably the most amorous, is also at the least distance from him, and the most obedient to his call; she does not fail to come first. The *cock* takes the grain with his bill; he gets before her; he prevails on her in the most affectionate manner to take it, to do him the favour to eat it; she accepts it; but hardly has she swallowed it, when the *cock* has already obtained his due.

The choice of a *cock* is a very important thing. It is accounted that he has every requisite quality, when he is of a good size, but middling, when he carries his head high, has a quick and animated look, a strong and shrill voice, the bill thick and short, the comb of a fine red, and in a manner varnished; a membranaceous wattle, of a large size, and coloured the same as the comb; the breast broad, the wings strong, the plumage black, or of an obscure red, the thighs very muscular, the legs thick, supplied with long spurs, the claws supplied with nails rather bent and with a very keen point; when he is free in his motions, crows often, and scratches the earth with constancy in search of worms, not so much for himself as

his mates; when he is brisk, spirited, ardent, and clever in caressing them, quick in defending them, attentive in soliciting them to eat, in keeping them together in the day, and assembling them at night.

The *cock* begins to pay his addresses to the *hens* from the time he is three months old; his full vigour lasts only three years, though he may live till ten. It is remarked, that in *cocks* of the large species, the procreative faculties are later in coming forward; they probably enjoy it longer. As soon as the *cock* gets less nimble, he is no more worthy to figure in the seraglio, his successor must be the finest, the most brave of all the supernumery young *cocks* in the poultry-yard,

When you hesitate between two such *cocks*, which appear equally fine, equally stout, you must, according to the advice given by a woman, make them fight together, and give preference to the conqueror. *Hens*, like other females, always give it to the male that is the most courageous, the most capable of charming them.

Peace does not last long between *cocks*, among which the empire of the poultry-yard has been so divided; as they are all actuated by a restless, jealous, hasty, fiery, ardent disposition, their quarrels are frequent, and are mostly bloody. A fight soon follows the provocation. The two adversaries face each other; their feathers are bristled up, the neck stretched out, the head low, the bill ready; they observe each other in silence, with fixed and sparkling eyes. On the least motion of either they set off together, they stand stiff, rush forward and dash against each other, and repeat the same manœuvre till the one that is most adroit, and is strongest, has torn the comb of his enemy, has thrown him down by flapping him with his wings, or has stabbed him with his spurs.

This disposition of *cocks* for fighting so desperately, especially when they are not used to live together and meet for the first time, the courage, the obstinacy, which they evince in this often dreadful contest, have given Englishmen the idea of exhibiting these *cock-fights* in public. It is that sort of tragedy they seem to like in preference. The annals of these sights mention a very singular sympathy between two *cocks*. They had successively beat all the others, they could never be made to fight together, notwithstanding the stimulus of the most hateful passions.

There are some *cocks*, which, by being too high met-tled, are snappish, quarrelsome; they fatigue the *hens* without making them fruitful. Jealous of the happiness of others, they disturb all the families of the other *cocks*. The way to quiet these turbulent ones is plain; their foot must be put through the middle of a bit of leather in a round shape; they become as quiet as men who are fettered at the feet, hands and neck.

The *cock* loves cleanliness, he is careful of his coat; you often see him busy in combing, polishing, stroaking his feathers with his bill. If, like the nightingale and the thrush, he has not the ambition of excelling in his note, one may at least think that he is particularly jealous in showing that he has a very loud, shrill, powerful voice. In fact, when he has crowed, he listens to know whether he is answered; or, should he hear another, he begins again directly, and he seems to defy him to raise his voice above his own. Often, of a dark night, this crowing, repeated by every *cock* in a village, has fortunately reached the ear of the benighted traveller, and has enabled him the better to direct his steps.

It is generally thought that the *cock* is not by nature intended to share the solicitude of the incubation and management of chickens; but we think, that on examining things more closely, this opinion will cease to be adopted. In fact, if, in the wild state, the *cock* were not attached to one female only, how could the latter set, and yet seek her food? This impossibility for the *hen* to perform these two things at that time, without the help of the *cock*, unquestionably proves that she then enjoyed that help. In what manner has he lost his manners and his habits? In the same manner as these are lost by civilisation, as one is brought to lose them by slavery; but is it true, that the tame *cock* has entirely lost the sentiments which characterize a constant husband and a tender father?

One can hardly be persuaded of this, on observing:

1. That the *cock* sometimes entices one of his *hens* in a corner, that he shakes about the straw he finds there, that he makes a nest, lays down on it, that he seems to invite his mate to lay her eggs on it, by praising such a comfortable place.

2. That he sometimes goes and perches on the edge of the nest where his favourite *hen* lays, to offer her his services, seemingly disposed to forget for her, to sacri-

fice to her, all his other *hens*, and behave entirely like birds that have but one female.

To these two observations which exhibit the traces of the ancient manners of the *wild cock*, and which inform us that the art of men, that the actual condition of the *cock*, have not completely perverted his nature, may be added the partiality he always bears towards one of his fine and young *hens*.

He is continually loading her with favours, presents, and kindnesses. It is remarked, that the hen is partial to such preference, that she mostly accompanies him in his search after food, that she is the first to attend to his call, to receive out of his bill the seed he has found, and it is presumed that she would willingly follow him, if he would disengage himself from the fetters of captivity, and would go and live with her under nature's laws, remote from the abode of men, and especially remote from the other *hens*.

If the *cock* loves young *hens*, he heartily detests old ones; and he slights them as soon as they are no longer fit for the reproduction of the species.

Cocks, as well as all organized beings, now and then exhibit monstrous appearances, which attract the attention of the curious. Two-headed *pullets*, four-footed *cocks*, &c. have been seen. These are nature's sports, which no longer require any explanation.

But there is a monstrous thing, more common than others, and which it is proper to quote, because it is the produce of art, these are the horns which are sometimes seen on their heads. They are placed there by a process, which consists in making an incision in the comb of a *cock*, in thrusting through this wound, and in applying to the skull the spur of a pullet. The prodigious size this spur comes to after the union it has contracted with the bones of the *cock's* head, unquestionably proves the similarity of animal graftings with those belonging to the vegetable kingdom.

Hen.

The *hen* has, like the *cock*, a comb on her head, and two membranes under her bill, but not so large, nor of so bright and shining a colour; the female, as in other birds, is smaller than the male: her plumage, though handsome, is less brilliant, less varied; her tail is like his in a vertical plane, without being accompanied by those

elegant plumes which hang over and adorn that of the *cock*.

It has been seen under the head of the natural history of the fowl, that India is the natal place of this bird. It is likely, that in this country only one single race of *wild fowl* should exist, seeing that among wild birds, varieties are scarce. But now, that under the protecting hand of man, they are established in every country on the earth, that they live in the hottest climates, as well as in the coldest countries, the races of *fowls* are uncommonly multiplied. It doubtless is the change of climate and of aliments which has produced these alterations remarked in their shape, or rather in those parts the least essential to their primitive character.

The races of *hens*, which should be bred in preference to others, are those which yield eggs in the greatest abundance, and whose flesh is the most delicate; these two advantages, and especially the first, are blended in the *common hens*. It is then chiefly with this species, that the poultry-yard must be stocked.

In selecting them, they must be chosen of a middling size, of a black or brown colour, a robust constitution, having a large head, sharp eyes, the comb pendant, the feet bluish; those with large spurs, which scratch, which crow, and call in the same manner as *cocks*, must be rejected; as also those that are savage, quarrelsome, peevish, because they are usually difficult to tread, because they scarcely ever lay, do not set well, and lose, break, and eat their eggs.

The *hens* that are too fat, and those that are old, are put by: the first, on account of their plumpness, rarely give any eggs, which are moreover soft ones: the others, easily told by the rough feel of the comb and claws, have given over laying.

Next to the *common hen*, which deservedly occupies the first rank, on account of her fecundity, the *tufted hen* follows, and is more delicate eating than the *common one*, because she takes more fat, by reason that she does not lay; and the *large breed*, which, without being more fruitful than the *tufted hen*, is preferable to the others for rearing pullets for sale, or for being made capons, or *hen pullets*.

The opinion the most generally adopted among breeders, on these three species of *fowls*, is, that the first being more fruitful in eggs, and the others furnishing larger *chickens*, they give them more profit than they could

clear by all those foreign *fowls*, which figure in the poultry-yards of luxury, and the list of which is of some length.

Yet, as it is of the utmost importance to them to know whether they have rightly calculated, whether they have not too lightly given their suffrage to these three species of *fowls*, they should first see, by following the laying of the *common hens*, for a whole year at least, what is their product compared with the expence they incur.

2. To repeat this experiment on every species of *fowl*.

3. Do this chiefly with a view of ascertaining whether the *common hens*, which give a greater number of eggs, but lesser in size, really furnish (allowing for their food) in the course of a year, a larger supply of aliments than that resulting from the sum of larger eggs, obtained from the other *hens* in the same space of time.

At the same time that one might devote oneself to these minute, but interesting inquiries, one should endeavour to fix at what degree of plumpness *hens* produce a greater quantity of eggs; for, as it is well known, *hens* badly fed, scarcely lay more than *hens* too well fed.

We should attempt to advance or put off the time of laying, so as to master it, as a skillful gardener masters the blooming of an orange tree, so as to distribute, with some equality, in the different months of the year, the quantity of eggs to be laid.

The most efficacious way of producing this effect, would be, according to Reaumur's opinion, to strip the *hens*, little by little, of their feathers, in spring, or in the beginning of summer, and so prevent the moulting, which, as it takes place towards the close of the fine season, then withholds the laying. It would be proper, in fine, to try which are the aliments that hasten or check the laying.

Several have already been laid down; but as yet there is nothing very precise as to their efficacy.

Hens are of a hasty, petulant, violent temper; they very often quarrel and fight with one another. Like all other birds of the poultry-kind, they have sanguinary inclinations, barbarous manners; they never see one of their companions in a weak, languishing state, without insulting her; if the blood happens to flow from the wounds just inflicted on her, the whole band of *hens* fly on her, and unmercifully lacerate her.

There is another trait, mentioned by Reaumur, and which strongly marks the ferocity of *hens*. He had shut

up ~~two~~ of them with a *cock*; these three individuals lived for some time in the strictest harmony: all on a sudden, the *hens* took a dislike to their *cock*; and they attacked him both together, and succeeded, in the course of five or six days ill treatment, in killing him. Surprised at such extraordinary conduct, Reaumur was curious to know what could be the cause of it: he gave the *hens* successively several *cocks*. Their fury kindled anew against each of them, and they would all have experienced the fate of the first, had he left them long enough to lose all their blood and all their strength.

Two things are particularly remarkable in this adventure: 1st, that those *cocks*, which were strong, bold, robust, which could very easily have mastered thirty rebel *hens*, were good enough not to defend themselves: did not even attempt to escape from the rage of these two furies. 2dly. That these *hens*, which were so mischievous when cooped up, became mild and tranquil as soon as they were let loose on the dunghill, and received the caresses of the *cocks* that came forward to meet them, with a very good grace.

Food for Fowls.

Fowls are, of all birds, the most easy to feed; every alimentary substance agrees with them, even when they are buried in dung; nothing is lost with them; they are seen the whole day long incessantly busied in scratching, searching, and picking up a living.

The finest, the most imperceptible seed cannot escape the piercing looks of a *fowl*. The fly, that is most rapid in flight, cannot screen itself from the promptitude with which she darts her bill; the worm, which comes to breathe at the surface of the earth, has not time to shrink from her glance; it is immediately seized by the head and drawn up.

The misfortune is, that when the *hen* has made the last mentioned discovery, she is not so discreet as she has been adroit; she makes it known by her cries; her companions come forward; they find her with the worm hung to her bill, and searching for a bye place to pick it in. They instantly, one and all, run at the prey. The worm goes from bill to bill, till it is at last carried far enough from the mob by the last one that has obtained it, to have the liberty of devouring it at her ease.

Fowls that are thus feasted on seed, worms, insects,

with every thing they have found, in an obstinate search on the dunghill, in the yards, in the barns, in stables, cow-houses, &c. only want at the farms, in spring and in winter, a supplementary feed, which is always distributed to them in the morning at sun rise, and in the evening before it sets. This meal is prepared in the following manner:

On the day before, boil in the washing of dishes such pot-herbs as the season affords; they must be mixed with bran, and then drained. On the following day this paste is warmed up and given to the *fowls*; when they have eat it, give them a certain quantity of the siftings of wheat and rye, or plain barley, buck wheat, Indian corn bruised, vetch, grey pease, the refuse of grapes, or apples, sound or stale fruit, cut in pieces, bread, crumbs, and other offal of the table and the kitchen, boiled roots, &c. Only according to the season, the portion of one or the other of these substances should be increased or diminished; sometimes, for instance, during the harvest, or corn-thrashing time, every distribution is withheld.

The evening's meal is similar to the morning's; they must both be served to them, either in the hen-house, if one wishes the *fowls* to share it, or near the hen-house, in a part managed so as they may not be exposed to wind and rain. Experience has taught us that it was essential.

1st. That the paste should be hot when given to them, because in that state it was more conducive to their health, and rendered them more fruitful, and nourished them more.

2dly. That the distribution of grain, boiled or raw, might be replaced by that of the boiled potatoe, mixed up with a certain quantity of the meal of such grain, or still better, by this mixture made into bread, and then into soup.

3dly. That corn was in general better when it had undergone a dressing, than when it was plain; and still more nutritious when it had been made into bread.

4thly. That the most excellent food for *fowls* was this same bread, soaked and mixed with boiled or hashed meat.

5thly. That there were instances, wherein the choice of the *fowl's* food was not indifferent, as during the laying, the setting, and especially the diseases they labour under; wheat and rye, their siftings excepted, do not make a part of *fowl's* diet; not because they are not very fond of

them, but because it is thought proper to reserve these for men.

Worm-Bed.

The strong taste that *fowls* evince for worms, has made us hit on the following ways of increasing them.

Make a paste with the leaven of barley, bran, and horse-dung; put it in a proper vessel; at the end of three days, if the weather is warm, it will be full of a multitude of worms, which serves the *fowls* to feed on. But here is another process on a larger scale.

In a part of the poultry-yard, high enough for allowing the waters to drain off, four walls are thrown up, each twelve feet in length, and four in height, which forms a square pit; into this pit is put the following, one after the other: rye straw chopped, fresh horsedung, light earth, moistened with bull's, or other animal's, blood, and a mixture of the refuse of grapes, oats, and bran. On the last bed, the intestines of animals, cut in bits, are laid; then beginning again by a bed of straw, the same ordered is followed as at the first, till the pit is filled up. It is then covered over with prickly branches, which are secured by large stones, to hinder the *hens* from coming near it. This mixture is, in a manner, changed into a swarm of worms, which is taken care of for them in the season, when the surface of the earth, being frozen, can no longer afford them any, and which is given them every morning in small portions.

When the poultry-yard is very large several more beds are laid; but great care is taken not to let them have their fill of them: Sometimes children are employed to follow a gardener and pick up the worms which he drives out of the ground in digging with his spade; or, again they are told to turn up the ground with a three-pronged fork. This motion, which imitates the labour of the mole, induces the worms to quit their hiding place to avoid their enemy, and thus fall into the children's hands.

Bones, coarsely powdered, may again be used as a change of diet for fowls; they digest them with as much ease even as the stones of olives, which, however, are voided whole by animals chewing the cud, and which are not to be found again in the dung of fowls.

The digestion of fowls being chiefly performed by trituration they are by instinct inclined to swallow small

stones to aid the muscular force of their gizzard; but it often happens that on meeting with glass, they swallow it the same as hard bodies, without troubling themselves about the faculty it has of cutting and piercing. The dire effects of this substance, which have taken place on several fowls, should induce breeders not to suffer that among the offal of the kitchen which is thrown to them on the dung-hill, there should be any glass. They should indeed extend this attention over many other substances. Some *hens* had eaten some muscle-shells, and many of them died. To save the others, their crop was opened, cleaned, and sewed up again: fortunately this operation succeeded; but it is still better not to have it to do.

Laying.

Laying is the action by which the female of birds brings forth her eggs. It further implies a certain number of eggs forming a brood. But under this last acceptance, the *laying* is usually repeated among all birds, twice a year; the first after winter, it is the most considerable; the second, which takes place towards the end of summer, does not always prove well.

The *laying-time* begins with fowls in the month of February in warm countries, and later in cold countries. After giving eighteen or twenty regularly, they would stop there, and would want to set on them. But experience having taught, that when one or more eggs were broken or taken away from a bird busy about its laying, it always replaced it, and that it never thought of setting but when the number of her eggs was complete; it was thought, in order to oblige the *hens* to furnish fresh eggs, to take from them every day those they had just laid; deceived by this cheat, the *hens* keep on laying, and every day on seeing their nests empty, they think they lay for the first time.

When a *hen* has a fancy or a want to lay, she goes backwards and forwards, seems very busy, is continually cackling, she visits every nook and corner, to find one where she may hide herself, and enjoy tranquillity. She rarely finds one to suit her; till at last the moment comes, when being too much in haste to continue to be so nice, she determines to enter the *hen-house*, and to

chose one of the baskets laid on purpose for nests; she goes up to it, settles herself on it; she is silent and lays.

There are some *hens* which adopt one nest in preference; if the moment she wants to go and lay there, she finds it occupied by another, she patiently waits till this one has laid her egg, to take her place. In general, it is remarked, that those *hens* that have not taken to one nest in particular, place themselves more willingly in that in which they find the greatest pile of eggs.

The *hen* too, in all probability, suffers in the operation of *laying*, although she complains not; but as soon as she has got rid of the egg, she gives herself up to transports of joy; she makes known her delivery by piercing and reiterated outcries, and which are repeated not only by her companions, but by the *cock* himself. In the number there are a few whose fecundity varies; some give only one egg in three days; others lay every other day, some lay every day; and lastly, some lay two in one day; but that is very uncommon, and when in general young *hens* do more than those of a middle age, they are smaller; and the old ones leave off at the end of their fourth year.

The *laying* of *hens*, excepting a few interruptions, continues till the end of the summer, it is then put a stop to by moulting, a species of disease they experience every year, and which attacks them, some rather sooner, and others rather later. *Hens* do not lay while this disease lasts, because their nourishing juices being employed in the developement and growth of the new feathers, there is none left for the purpose of making eggs grow.

This moulting season is for all birds a time for retirement; no more love, and hence no more joy.

The *hens* especially, are then very weak, dull, drooping; their feathers bristle up, they are only busy in plucking those that are ready to fall, they sometimes totally change their plumage; they are seen to alter from black to white, and from white to black.

The cold weather, which then begins to come on; contributes to prolong their repose, it continues till the beginning of spring.

Wearied of this long inaction, which nature allows fowls, doubtless for their greater advantage, man, who thinks of nothing but his own interest, has attempted

several means of putting them in activity; it seemed to him very hard to go through the winter without eating new laid eggs.

Here is the method which has best answered his purpose for obtaining them:—

Some stout *hens* are selected; they are shut up in a warm and light room; a brave young *cock* is given them, with an abundant and over-heating food, and they are kept in the greatest cleanliness.

It has been remarked, that this forced and unseasonable labour wore out the *hens* that were submitted to it; and that they came sooner than the others to old age.

Has the *hen* only a settled quantity of eggs to supply us with during her life-time? According to this remark, this means should not be resorted to before having well calculated the profit which must arise from it, every thing duly compensated. This calculation, this enquiry are so much the more necessary, as Reaumur says, that he had not been able to bring *hens* to lay during the winter, by feeding them on hemp-seed, that is the seed which is allowed to be the best for making them lay, he, 'tis true, kept them in a place heated by beds of dung, and perhaps, notwithstanding his precautions, the exhalations of this dung-hill might diminish the vigour of the *hens*.

Besides the hemp-seed employed in Reaumur's experiment to over-heat *hens*, and induce them to lay, plain oats, buck wheat, and common millet, are moreover used in all seasons. But it has been observed, that when the laying was forwarded with *hens*, the shell of their eggs was much less weighty, and that they often had but a mere membrane, as when they are laid by *hens* that are too fat. During the hard winter of 1788, some *hens* had lost their combs and their feet by the frost; in the spring they walked on their knees, and were not the less apt to lay as usual.

But they do not always want *cocks* to produce eggs, they grow naturally on that bunch which is called ovary, they can, independent of any communion with the male, grow, increase, and improve, without being fecundated; when voided in this manner, they are what is called *clear eggs*. They are accounted, perhaps without foundation, less wholesome than the others; but they have that invaluable advantage of keeping better, and can be removed

without danger, as we have said under the head of the *EGG*. A *hen* put in a cage, was seen to lay regularly every other day, from the month of March, till about the end of October, during two years, without ever evincing a fancy to set.

Setting.

Hens live only five or six years, and being already old at four years, one is obliged to renew them often.

Pullets, capons, hen-capons, affording a dish in very great repute, it is to the interest of breeders to procure chickens; therefore there is necessity on one side, and advantage on the other, not to consume all the *hen's* eggs; and to allot a certain quantity to be submitted to the operation by which birds hatch their young ones. *Setting* is with almost all birds, performed in the following manner:—

The female seats herself lightly on her eggs, softly presses them, covers them closely with her body, embraces them with her wings, communicates to them the caloric which constitutes her natural heat, elevates their temperature to the thirty-second degree of Reaumur's thermometer, and until that time fixed, but varied by nature, for the emission of the young ones of each species of birds; she keeps them up to this degree, either in being succeeded by her mate, when the latter is fit to share the cares of incubation, or when she alone has the care of it, in remaining day and night, without any intermission, but one instant she takes each day for eating her food and voiding her excrements.

The name of *brood* implies the number of eggs that the female of birds submits at once to incubation. This number, which is more or less considerable in broods of different birds, seems to be determined after alimentary resources, more or less abundant, which the little ones will find when hatched.

Therefore, in birds of the poultry-kind, the little ones eating alone on their emission from the shell, the quantity of eggs to a brood, is precisely that which each mother can properly warm, by covering them with her body and her wings, which she shapes like a cradle, whilst, in most other birds, there is no more than two or four eggs to a brood, not because the females of

these birds cannot set over a greater quantity, but because she being obliged to provide food for their young during a certain time after their birth, she could not do for them if they were too numerous.

The females of birds are in general disposed to set as soon as their laying is over. *Hens* alone often make an exception to this rule; induced as they usually are to continue laying during the greatest part of the year, both on account of too abundant food which is lavished on them, and on account of the cheat which we have said was used to be put on them, they very often exceed the quantity of eggs necessary for their broods, without evincing the least fancy to fulfill that natural function which renders their fruitfulness of use to the propagation of their species; those in small numbers that have a mind to lay, make it known by a particular note, which is named *clucking*.

This inclination shortly becomes a very strong passion, they are seen to flutter about, hang their wings, bristle up their feathers, search every where for eggs to lay on; if they meet with any, whether produced by *hens* or by other birds, they seat themselves immediately on them. If they find none, they even go and place themselves in the baskets which contain nothing but false eggs, put there to tempt them to lay; they do not leave them afterwards, they may be drove repeatedly from them, they always come back to them. There are sometimes *hens* which want to set before they have done laying, before the proper time for setting.

This too forward ardour is abated by thrusting a small feather through the nostrils.

It is not sufficient for *hens* to evince a fancy to set, to be entrusted with this business, experience has learnt, that they are not all equally calculated for performing it well. Those the most apt to it, are at least two years old; they must not take fright at any thing; they must be of a strong complexion, must have a broad body, large wings, well supplied with feathers, their nails and spurs must neither be too long nor too sharp.

In order to ascertain the propensity of a *hen* of this sort to lay, she is left for a day or two in the nest on a few eggs which are given up for this purpose; if she remains on it with constancy, she is deemed a good setter, and she is taken to the place where the quantity of select eggs, necessary for each brood, has been laid

out in baskets. She is laid softly on the eggs, she is covered with a cloth, which is only taken off her but once a day, in the morning, when she is taken up to make her eat her meal, which is set by the side of the nest. A necessary precaution for keeping her the least possible time absent from her nest; let not the least cold, especially towards the end of incubation, cause the young ones to perish in their shells.

Those eggs intended to be submitted to incubation, must be gathered up with still more care than if they were to be employed as aliments.

Out of the eggs produced by *hens* of the best race, and during the second year of their life, the largest must be taken, because they give, or are presumed to give, the largest and stoutest chickens.

One must be positive that the eggs are fecundated; too many persons by having put clear eggs to be hatched, have taken a dislike to hatching chickens.

Therefore, although Harvey affirms that a cock fecundates at one time the eggs that a *hen* will lay during the whole year; although experience really proves that a mere coupling of the *cock* and *hen* made those eggs fruitful that were to be laid during a month; one has the attention to gather those eggs only that are furnished by *hens* that live with very stout *cocks*, and to be still more certain of one's point, the eggs of one's own *hens* are preferred.

At one time the necessity of renewing the poultry yard requires females; at another, the profit of an advantageous sale makes one wish to have males; it is therefore expedient to know how to distinguish the eggs whence will arise both the one and the other.

Formerly, pointed eggs were chosen for having *cocks*, and rounded ones for having *hens*; but now they are known by more certain signs; the eggs are examined by candle-light, if at one end you observe a small vacancy under the shell, and that this vacancy be exactly at the top of the egg; it contains the sperm of a male; if it is a little on one side, it is a female.

Eggs thus chosen and selected as fast as they are taken out of the nest, are put, without shaking them in the least, in a basket, insulating them with saw-dust; this basket is hung up in the air in a dry, cool, dark place, till the end of the laying, till the time for setting.

The place appointed for setting must be dry, warm, clean, and to the south; it must be closed, and so laid out that the setters may enjoy the greatest tranquillity, that no noise may disturb them; that the *cocks* and other *hens* come not to interrupt them. It must be supplied with as many baskets as setters are wanted; in these baskets, of a suitable height and diameter, nests are arranged which are made with fresh straw; they are made concave, and the bottom is covered with feathers.

Cares to take, Rules to observe, Remarks to make during the Setting.

The *hens*, the eggs, the place, being thus settled for laying—

1st. The eggs are again examined, taking them carefully out of the basket in which they had been put by as fast as they were taken out of the nests; taking care that the oldest are not more than three weeks old; they are ascertained to be not damaged by a too great evaporation, when they are still heavy enough to sink to the bottom of the water. In truth, some experiments have proved, that eggs six weeks or two months old could be successfully hatched, but it is not prudent to trust to them. Besides other experiments have clearly shewn, that the freshest eggs were the easiest to hatch, and produced the strongest and stoutest chickens.

2d. The number of eggs given to each setter varies according to their size, according to the compass of the *hen's* wings, and again, according to the temperature of the weather. Towards the close of winter less is given to them than in summer, in order that they may cover them more closely, defend them more exactly from the cold which is prevalent at that time. Therefore, a *hen* to which ten or twelve eggs only would be given in February, might set over fourteen or fifteen in March, and as many as eighteen in April.

3d. It was formerly prescribed to begin setting at the close of the full of the moon only, to put the eggs always in odd numbers; to preserve them from thunder by arming the nests with old iron; to preserve them from foul air with aromatic plants; but we are now sensible of the absurdity of such trifling nicities, and the farmers' wives are hereby requested to notice them no more.

4th. Spring and autumn are the most seasonable times for putting *hens* to set; the temperature is then more suitable; eggs are in greater abundance, better conditioned, the *hens* more heated.

If, however, one wanted to hatch chickens in winter, the same *hens* should be used, as would have been cooped up during that season in a warm place, in order to obtain eggs from them by a more substantial food than usual. A fancy to set should be given them by warming them with mustard-seed, with wine sops, leaves and seeds of nettles dried and powdered. If this regimen would not do, one must have recourse to the same process by which *turkey-hens* are induced to set during the winter; they are fed with wine sops and sugar, they are wrapped up so that their head and tail only may be loose; they are kept on stale eggs for two or three days; at the end of that time, on being set free, they consent to set over good eggs which are substituted to the bad ones.

These winter-broods are, in fact, not much used, doubtless because it is known by experience that they did not always answer so often nor so constantly as the others; but if the first spring broods are already much more lucrative than the second, on account of the dearness of poultry at that time, what profit would not accrue from the winter ones? And is it not evident that one would be amply indemnified for the extra expense they would require, by risking a greater number of eggs to have the same number of chickens.

5th. The eggs of different *hens* must not be put together, neither at different times the eggs of *hens* of the same species, because they do not hatch at once, and because the *hen* leaves in the nest those that are last, to lead the chickens that are come out of their shell.

6th. Reaumur has imagined the varnishing of eggs, with a view of being able to hatch them more than six weeks after having been laid; but this method must not be resorted to, at least for fowl's eggs, because it is difficult to take off the varnish, and because experience has not shewn in the most unobjectionable manner, that this varnish, which remedies very well the evaporation of the moisture of the egg's liquors, is the safest preservative of the sperm. Besides, new laid eggs are easily got at.

7th. The eggs, once under the *hen*, must never after be touched; to her must be left the care of turning them about as she thinks proper, to bring those on the cir-

cumference to the center, and those in the center to the circumference, in order to warm them all equally alike.

A *hen* knows much better how to manage this business than the most intelligent keeper.

8th. It sometimes happens that a setter is impatient, that she often wants to get out of her nest; as soon as this is perceived, one half of the quantity of food which usually forms her meal must be curtailed, when she has eat it, she is replaced, half full, on her eggs, and a little hemp-seed, barley, or millet is held out to her in the hand. This supplement to her meal has the best effect; she gets used to it; she then remains on the eggs as voluntarily as the other females, which wait for the aliments that the males would bring them. To accomplish without doubt the same end, certain keepers put the food so near the nests, that the setters may make their meal without being obliged to leave their eggs; but this method considered in general is improper, because it is ascertained that *hens* must have a little exercise, take the air, and that it is beneficial for the eggs that the air in which they are involved should be renewed from time to time.

9th. There are some setters that eat their eggs, or break them; this is the way to cure them of this fault:—

An egg is boiled hard, it is then bored in several holes; it is handed to the *hen*, she pecks it like the others and burns herself; then by the same reason that a scalded cat fears cold water, so will she not take it any more in her head to attack even cold eggs.

10th. It is more advantageous to put several *hens* to set the same day, so that, should an accident happen to one of the setters, it may be remedied by giving up to another the eggs that are to be hatched, which is done by slipping them under her, being careful not to give her more than she is able to warm.

11th. To procure a greater number of *hens*, and preserve the *hen's* ability of laying, they are replaced for the setting by *turkey hens*, which are uncommonly well calculated for this operation, and which are able to set over from twenty-five to thirty common fowls eggs.

12th. There are some people, who on the eleventh or twelfth day of incubation examine the eggs in the following manner:—

They have a drum, they put it in the sun, they place the eggs on it one after the other; if their shade wavers

by the motion of the chick, they put them back in the nest, and throw away those in which no motion is perceived.

13th. Many people, after eighteen days incubation, dip the eggs in hot water, under a pretence of softening their shells; 'tis a bad custom, which only disturbs the operation, and sometimes makes it fail entirely. However important, for the good success of the setting, the precepts and observations we have just laid down, experience proves that nature, left to her own means, can, without any inconvenience, neglect them.

The love of liberty, the fancy of stealing nests abroad and their young ones from the eyes and search of their enemies, that instinct which brings back *hens* to their primitive state when they are about to fulfill the important functions nature has entrusted them with, sometimes induce them to go, and lay, and set in a bye place. They return back to the farm-yard in triumph, with a set of little chickens, often in better health than those which are indebted for their existence to combined cares, a select setter, and an intelligent keeper. Some *hens* have been seen to go and build their nest in a park, lay there, set there, settle themselves there with their families, become wild, clothed with a greater quantity of feathers, not lay so often, have a less tender but sweeter flesh, remain faithful to their *cocks* till the death of the latter, give themselves up afterwards to *pheasants*, and give birth to mules.

Developement of the Fœtus in the Egg.

The principal authors who have written on the formation of the chicken, are Fabricius ab Aquapendente, Harvey, Maître-Jean, Malpighy, Blasius, Haller, Vicq-d'Azyr, Bonnet, Munro, and Leveillé.

If one wishes to know exactly the progress of the fœtus during the whole time of incubation, Haller especially must be consulted, he has followed them from twelve hours to twelve hours, and has given a very particular account of it.

If one wishes to know all the changes which take place in the constituent parts of the egg, to facilitate the growth of the fœtus, it will be proper to read the *Dissertation Physiologique de M. Leveillé sur la nutrition des fœtus considérés dans les mammifères et dans les ovipares*,

There results from Haller's observations :—

1st. That at the end of twelve hours a commencement of organization is already perceived in that spot which is called *cicatricula*, and which we have said was placed on the globe of the yolk, and always to be found, by a peculiar mechanism, at its upper part, in whatever situation the egg is in, to the center of which this globe is suspended.

2d. That the parts of the foetus which were invisible before incubation, on account of their exiguidity, of their fluidity, and of their transparency, gradually acquire the consistence which suits them, so that those which are to be solid, as the bones for instance, become gelatinous, membranous, cartilaginous, before they become bony.

3d. That in developing themselves, some rather sooner, others rather later, according to their importance in the organization of the chick, they lose, more or less hastily, their transparency, and come into shapes and situations by which they may be known. Therefore they do not become discernable but at different times; the first day the head and spine can be distinguished; the second, the vertebræ and the heart; the third, the neck and breast; the fourth, the eyes and the liver; the fifth, the stomach and loins; the sixth, the lungs and skin; the seventh, the intestines and the bill; the eighth, the gall bladder and the ventricles of the heart; the ninth, the wings and thighs; the tenth, all the parts which are to constitute the chick are in their places; they then have the form which characterises them. On the following day they develope, and come to the full size they are capable of attaining; the chick is then strong enough to break his shell, which he does on the twenty-first day after incubation.

By M. Leveillé's *Dissertation*, will be seen the analogy which is between the position of the foetus of mammiferous and oviparous animals in their respective wombs.

What difference there is between the organization of the liver in the foetus of the first and in that of the second. Why there is in the gall-bladder of the latter an abundance of bile, while there is none, or at least very little, to be met with in the bladder of the others.

One will learn to distinguish the umbilical cord of the foetus of birds, by the help of which the chick is nourished.

It will be known, that the membranes which envelope

all the parts contained in the egg, form, by their arrangement :—

1. A peculiar cavity for the fœtus and the waters that bathe them. 2. One for the whole of the yolk and the intestines of the chick, to which may be subjoined all the vessels which accompany them out of the lower belly. 3. One for the vitalline mass. 4. One for the third albumen. 5. One for the second. 6. A last-one, very extensive, fit for uniting all the others, and with them all the different substances they contain.

One will know the connexions which exist between the chick and the substances appointed for keeping it alive in the egg. How erroneous were those ideas on the yellow vessels, and on the pretended canal, which communicates from the capsula of the yolk with the intestinal tube. By what means the white is transferred in the shell of the yolk, in order to extend the latter, to render it more susceptible of being absorbed and whirled in the torrent of circulation. In fine, what is the mechanism which nature employs to expulse the bird.

Stored with these diverse instructions, drawn from M. Leveillé's work ; this is how one will conceive what passes in the egg during the incubation.

The principle of life, introduced by the act of the male in the egg began on the ovary of the female of birds, contributes, perhaps, to organize it for the end nature has in view. But as soon as this egg is out of the female's body, the principle lies dormant, till it is roused by the caloric, communicated by the fowl that sets.

Then, in concert with this agent, it gives motion to the embryo which it is entrusted to animate; it procures it the property of growing, of employing to its organization, to its nourishment, all the substances which are contained with it, in this insulated womb, but which performs the same functions as those of mammiferous animals.

Then the yolk of the egg increasing in quantity, at the expence of the albumen, whose fluid part it absorbs ; it becomes a salutary milk, which is conveyed to the liver, which is elaborated there, and which afterwards passes into the circulation.

The yolk, till the nineteenth day of incubation, forms in the egg a distinct body from the bird enclosed in a separate capsula ; there is only a communication between them, but by means of the vessels, which serve instead

of the umbilical cord. But at that time it enters entirely into the abdomen, and by its presence so much increases the size of the chicken, that the bag of waters has no longer a sufficient capacity for holding it; it breaks; the pulmonic organs are put in contact with the air which has penetrated into the egg, to fill up the vacancy, occasioned by evaporation.

The chicken breathes, he chirps, his vital force acquires more energy, he moves his limbs, his bill works, his shell is broken, and he comes out.

Young Chickens.

It is commonly the twenty-first day of incubation that the chickens break their shells and issue from their prisons. Some perform this operation easily enough, or at least, quickly enough: others experience more difficulties, either on account of the shell, which the latter attack being harder, or because their bill is weaker than those of their comrades.

On that day the setters must be attentively watched, and one must be in readiness to help the chickens which have not strength enough to make a sufficient aperture in the egg, or which are left sticking to the shell, by the remains of an albumen which has thickened; but this emission of the chickens is so much the less dangerous to them, as it is natural and not forced. It should then only be facilitated, but in the utmost danger, when, after some useless efforts, the chick is reduced to inaction; the greatest dexterity should then be employed to help without hurting it; for the least scratch would kill it. The weak ones are strengthened by wetting their bill with warm wine, sugared, which gets into their mouths when they open it, and they then swallow a few drops.

The day of their birth, *chickens* do not want to eat; they are left in the nest. They are taken on the morrow under coop, a kind of large basket, lined inside with tow, and they are fed, as also on the following days, with crumbs of bread, soaked either in wine, to strengthen them, or in milk, to give them an appetite; if they are loose, the yolks of eggs are set before them. Very clear water is laid for them fresh every day, and now and then they must have some chopped leeks. After having kept them cooped up warmly under this coop, during five or six days, they are turned out a little in the sun, towards

the middle of the day, and they are fed with boiled barley, millet, mixed with curdled milk, and a few pot-herbs chopped up.

At the end of fifteen or eighteen days, the *hen* is allowed to lead her little ones into the poultry-yard; but as she is then able to manage twenty-five or thirty, those of another hen are added to hers; and the other one is put back again to set or lay.

The inducements for choosing one of these *hens* from the other, for giving them the management of *chickens*, are a full sized breast, and a great compass of wings, in order that they may still experience the useful influence of a second setting.

Chickens.

The tenderness and solicitude of the *hen* for her little ones are rightly boasted of. The alteration that maternal love has produced in her temper and in her habits are really worthy of admiration. She was ravenous, insatiable, vagrant, timid, pusillanimous; as soon as she is a mother, she turns out generous, frugal, sober, reserved, courageous, and intrepid; she assumes all the qualities that distinguish the *cock*; she even carries them to a higher degree of perfection. When one sees her come forward into the poultry-yard, surrounded by her little ones, which she leads there for the first time, it seems as if she was proud of her new dignity, she takes a pleasure to come and fill that office in the sight of the male, to shew him the results of setting; of that operation which she has performed without his assistance. Would not one think that she wants to inform him that she very well knows how to support her *chickens*, to watch and to defend them without his assistance? What haughtiness, what gravity in her gait how slow and studied it is; 'tis that of the *cock* himself in the midst of his *hens*. It could not be better imitated; but she further gets ready to equal him in courage, and to surpass him by her vigilance and her attachment to her brood.

Her eyes are lively, animated, and constantly on the alert; her looks are so quick, so rapid, that she could take in every object at one glance, that she appears to discover at once, the small seed on the ground, which she points out to her young ones, and in the clouds the bird of prey she dreads for their sake, and which she

gives them notice of by a doleful cry, which induces them immediately to hide themselves.

Incessantly taken up with their welfare, she excites them to follow her and to eat; she picks their food; she scratches the ground in search of worms, which she gives up to them; she stops now and then, she squats down, and forming cradles with her wings, she invites her tender offspring to come and gather round and warm themselves beneath them.

She continues to bestow these cares on them till they are of no further use to them, which takes place when the *chickens* are quite feathered, and when they are come to half the size they are to grow to.

Out of these young ones, come to this size, the finest *hens* are kept for replacing the old *hens*; the stoutest young *cocks* are also kept for succeeding those that have exhausted themselves: the rest is either sold at market or submitted to emasculation.

Capons.

They are *cocks* deprived of the faculty of reproducing, so that by prolonging, in a manner, their youth, they may preserve that white, tender, and delicate flesh, which they have in their first stage; and that by being unexposed to the torments of love, and exhausted by its pleasures, they may, in perfect repose, in absolute indifference, get fat at their ease, and come to a complete corpulency.

Though the method of emasculating young *cocks* was very anciently practised in India, and in Rome, and though it is generally diffused throughout Europe, it is not employed in Egypt. It is very remarkable, that in that country, where the virility of man is so little spared, the organs of generation in other animals should, however, be respected: is not this the remains of their former idolatry for them?

Young *cocks* are emasculated at three months old; and as much as possible before the month of July, because it has been observed, that the *capons* which were made in the late season, never proved so fine. Those young *cocks* issuing from a large species, are used in preference for emasculation, by reason of their being more easy to

fatten, of their growing larger than others, and selling at a higher price.

The operation they go through, consists in making an incision near their genital parts, to thrust the finger through this opening, in order to come at the testicles; and draw them away with dexterity, without hurting the intestines, to sew up the wound, to rub it with oil, to throw on some ashes, and finally, to cut off their comb.

When this is done, they must be fed with sops in wine during the two or three days that they must be cooped up, in a place where the temperature is not too high, because it has been remarked, that when the weather was very hot, the wound often turned to a mortification, and that it killed them, as also when the operation was badly performed.

Columellus informs us of another mode of emasculation; it consists in cutting off the spurs of the *young cock* to the quick, with a hot iron, and afterwards rubbing them with fuller's earth.

This emasculation is unquestionably less cruel than the other, and should, indeed, be preferred. But does it answer, as he affirms it does? We have some difficulty to persuade ourselves of it. In fact, what have the spurs to do with the organs of generation, unless it be, perhaps, to give the *cock* the facility of clinging to the females in coupling?

The *capons* are hardly ever again subject to moulting; their voice has no longer that strength and shrillness it formerly had: they are, therefore, not very eager to utter it; they are dull and melancholy. The *cocks* use them very ill; the *hens* detest them; they would soon fall victims to them, if man, who has not degraded them for the purpose of being the delight of their society, did not take them away to put them to the business to which they are suited, and make them accomplish the proposed end. This business is to drink, eat, and sleep, in order to get fat with all possible expedition. How many men, without being in the same condition as these birds, have no other trade, and aim at the same end!

Bringing up of Capons for Setting and for leading Chickens.

Persuaded that the *capon* was only fit to be eat, it

never occurred to do any thing else with it; but, on considering its docility, it was thought of trying whether it would not be possible to train it up to lead *chickens*.

The following process has completely succeeded:—

You must choose a plump, stout *capon*, pluck his belly, rub it with nettles, make him drunk with a toast and wine, repeat the same two or three days, during which, he is cooped up in a close place; from thence he must be taken under a cage, with two or three chickens, which eat with him, and slip under his belly as with their mother, which calm his smarting pains by their down, to which he takes an affection through gratitude, which he calls back when they leave him, whose number is daily increased, till he has as many as the size of his body, and the compass of his wings will allow him to cover. When he has got about him all the chickens he is to lead, he must be left still two days with them under the great coop; and must then be allowed to walk about as he conducts his flock. He manages them as well, and with as much attention as the most attentive *hen*.

It was, doubtless, very useful to bring up *capons* to replace the hen in the management of *chickens*; but could not a less cruel mode be contrived? It is what Reaumur has done; he has thought that it was not necessary to make the *capon* drunk, in order to learn him the business of a leader, still less so to pluck him of those feathers which could contribute most to warm the *chickens*. He has thought, and has proved, that it was sufficient to put him singly at first in a tub, not very broad, but pretty deep, to cover it over in order to let him have but little light, to take him two or three times a day out of the tub to put him under a coop, where he found seed, then to give him two or three *chickens*, which are taken and fed with him under the coop, to get him used not only to bear these, but further, to receive others, whose number was successively increased till forty or fifty, as in the first mode, and which he lead the same.

The *capon*, turned a leader of *chickens*, again appears in the poultry-yard at their head, not as he was before, dull, ashamed, and humbled, but proud, haughty, and triumphant; and such is the influence of audaciousness over all animals, that this borrowed mein imposes in such a man-

ner on the *cocks* and *hens*, that they do not attempt to disturb him in the discharge of his duty. He is at first rather awkward; the desire he has to assume in his gait, the dignity, the majesty of the *cock*, makes him hold his head too high, and too stiff, and not see the *chickens* which rush under his feet, and which he maims; but soon grown wise by this misfortune, he takes more care, and the like accidents do not occur again.

As the *capon's* note is not so expressive as the *hen's*, in order to prevail on the *chickens* to follow him, and gather about about him, this has been supplied by putting a small rattle about his neck.

When the *capon* is once instructed how to lead *chickens*, he is so for ever after, or at least, it is very easy to set him to it.

When services have been obtained from any individual whatever, it is rare for him to be left alone, and for one not to endeavour to obtain fresh ones from him. This has been done with respect to the *capon*. Men wanted to see whether he was agreeable to set, and this new experiment has again answered. After some preliminary preparation, analogous to those which bring him to lead *chickens*, they have succeeded in making him set; and this ability in the *capon* is so much the more advantageous, as he is able to set over as many as twenty-five eggs; after incubation, can lead the *chickens*, and may be made to recommence the same business two or three times, more especially if one has attention to feed him well. Were this practice generally adopted, the *hens* would lay without disturbance, and without interruption, till the moulting time.

Hen Capons.

By this name is meant, those *hens* whose ovary has been taken away, either when they have left off laying, or before they have begun to lay.

This operation, which is performed in the same manner as that which is practised on *cocks*, renders the *hens* barren; it prepares them for getting uncommonly plump, and acquiring a sweet and delicate flesh.

To this operation are submitted, all *hens* that are remarked to have essential defects, which, as it has been before said, render them unfit for laying or setting,

as it has been done to *chickens* which do not possess in a sufficiently high degree the requisite qualities for becoming good *cocks*.

The *hens* of large races especially are caponised in preference, both because they lay less than the *common hens*, and because they yield, after being fattened, fine pieces of poultry, which are very much sought after, and which sell very high.

Manner of fattening Poultry.

The manner of fattening poultry should seem to be extremely plain. One might think that it were sufficient to feed them at regular hours with wholesome and abundant food, capable of satisfying them. This mode, would, indeed, be very healthful for them, it would increase their size and strength, it would procure them an uncommon share of good health; but to accomplish the desired end, it is not necessary to strengthen them, nor to give them a vigorous health; it is wished, on the contrary, to give them a true malady, a kind of cachexy, the effect of which is, an extraordinary plumpness, by far superior to that which suits them for enjoying their faculties in their full energy; so that they would not fail to be choaked with fat, were they not killed in time. They are wanted to be fattened, not for their own advantage, but for our's; and to accomplish this, such means are used as it would not chuse of itself.

One of the following methods is had recourse to:—

The first consists in cooping the poultry in a dark place, in feeding them abundantly with barley, or buck-wheat, or maize, either of these seeds boiled and made into balls.

The second, practised in Mans, has this particular, that instead of letting the poultry feed at liberty, they are made to swallow rolls of paste in an oval shape, having about two inches in length, by one in breadth, made of two parts of barley-meal, of one part of buck-wheat and a sufficient quantity of milk.

The third is accounted more expeditious than the preceding ones; it prescribes to put the fowls in rows of pens, placed in a warm part; to cram them two or three times a day, by means of a funnel, with the meal of barley, wheat, small millet, maize, soaked in milk; to give them at first a small quantity of this mixture, in rather a

liquid state, by reason that no drink is given them; then to increase successively the dose, till it fills entirely their crop, allowing time enough to empty it at their ease, before the same manœuvre is begun again, in order not to disturb their digestion.

The cages employed in this third mode, are a series of small pens, in which each fowl is separate, in a manner cased up, and so closely wedged in, as it cannot move but with great difficulty; all that it is allowed to do, is to thrust its head through one hole, and void its excrements through another.

The funnel, by means of which a man can cram fifty *fowls* in half an hour, is thus described.

On a stool, breast-high, rises a kind of funnel, into which the victuals are poured; out of the lower end of this funnel comes a bended pipe, nearly similar to that of a tea-pot, you thrust down inside the funnel till it comes near the bottom, a secret supplied with a valve, by the side of which the victuals run down to the bottom of the funnel; this secret is suspended by a small iron rod, secured tongue of iron also, which springs, and shoots up from the stool, above the brim of the funnel; to this same tongue a cord is hung, which descends to the foot of the stool; it is there stopped by a small moveable board, which the feeder can press with his foot; by this motion, the cord draws the iron tongue, which, in falling, forces the spring, by which the valve is closed, down lower than the bottom of the funnel, and by that means, this secret performing the office of a forcing-pump, forces down the paste, and compels it to come out of the end of the bended pipe, which the fattener holds in the bird's bill, above the tongue. He is careful to draw away the *chicken* the instant he feels it has food enough; if he goes beyond the proper dose, he unloads it in a vessel placed above the machine, to prevent its choaking.

Every time the funnel is used, it must be washed with cold water, for fear there should be any remains of the victuals, which would get sour.

The *chickens* fed in this manner, which is particularly well suited to poultry-dealers, are, at the end of a week, very white, and well tasted: in the course of a fortnight, they have come to the utmost of their fat.

Some persons add to the prescribed food a little seed of *hen-bane*, with a view of making it sleepy; but there

still remains to be known, whether this seed really partakes of the properties of the plant whence it is taken. Others mix up with it the leaves and seed of nettles, dried and reduced to a powder.

Lastly, instead of putting *capons*, *hen-capons*, or other *fowls*, in pens, many people coop them up in frails hung in the open air, and made in such a manner that their heads peep out one side, and their rumps on the other; thus packed up, and immoveable, they eat, sleep, and digest nearly the same as in pens.

Formerly, under a pretence of ridding them of vermin, which, during the operation of fattening, torments them, and hinders the effects of it; they were plucked on the head, under the belly, and under the wings.

In short, gluttony had made men so ferocious and short-sighted, that instead of putting them, as we advise it, in a dark place, they put out their eyes.

At the time when the nation had a decided taste for spices and aromatics, people contrived the varying, at pleasure, of the flavour and perfume of the flesh of poultry; they mixed up with the paste for fattening them, sweetmeats of musk, anniseed, and other aromatic drugs. In England, they made a paste composed of flour and treacle.

One of our queens was seen to expend fifteen hundred *livres* to fatten three geese, whose livers she wanted to render more delicate.

One knows that this method, which could be followed by very rich people only, did not take with the breeders, and that it was to pass like a mode.

However, we think, that this ancient idea should be taken up again, but in putting more wisdom and economy in the execution of it. We think, that it would be very important to look after, and come at, those common substances which, added to the fowl's food, can render it more savoury and sweet.

In fact, if thrushes are excellent when they feed on grapes, if their flesh is bitter when they find nothing but juniper berries; if black-birds are not so good eating when they live on ivy-seed, if there is such a wide difference between the rabbit that lives on cabbage-leaves, and that which crops thyme, what might not be expected, by adding to the chickens' diet, such substances as are capable of modifying the flavour of their flesh to advantage?

Is it not already well-known, that some *turkies* that had eaten a great many onion leaves, had flesh of an exquisite taste; while others, which had gone through the forest of Fontainebleau, had a very disagreeable one? Is it not known that male nettle, parsley, fennel, wild succory, milfoil, garlic, introduced into the paste for young *turkies*, have altered the flavour of their flesh for the better? Is it not known, in short, that *chickens*, into whose food calcareous phosphate is admitted, become stronger, and their bones more solid?

Every body is acquainted with the use made of the flesh of all the individuals that compose the family of *fowls*. The *cock* does not get fat in his profession; at a certain age, his dry and tough flesh is not very relishing; it is not served at the rich man's table, his crest and his giblets only, make their appearance there; morsels of this kind, held in estimation by modern epicures. However, with the entire *cock*, very nourishing soups, and very excellent jellies are made; but he no longer yields, as he formerly did, any other extraordinary medicaments to sick people, who, less credulous and superstitious, and perhaps less grateful, no more think of offering up one of these birds to the god of medicine on their recovery. *Chickens* afford light, cooling soups; very good ragouts are prepared from them; when emasculated and fattened, they are roasted, and present dishes as agreeable to those in good health, as those recovering from sickness.

They are no longer thought to give the gout, by reason that they are themselves subject to it: but merely, because they foment the gluttony of those to whom this passion is reputed to give it.

Sometimes an entire *fowl*, with the belly plucked, is applied to the head, in the diseases of the brain; and to the region of the heart, in malignant fevers, and it is pretended, that it draws away the morbidic humour; but all these pretended virtues are like those of many more, numbered with fables, and their medical use, with ridiculous and useless practices.

The dung of *fowls* was formerly employed inwardly and outwardly; it is now left entirely to the disposal of agriculturists, who derive almost as much advantage from it as from that of the pidgeons, when they know how to use it properly.

Cocks and *hens* are subject to different diseases, which

can be cured, or rather prevented by proper care, grounded on the observation made by all accurate observers, viz. that it is necessary these birds should have a sufficient quantity of appropriate food; that they should have good water to drink; that they should, in the day-time, enjoy a large extent of ground, where they may divert themselves at their ease, particularly on the dung-hill, warm themselves in the sun, find shelter against the rain, wind, intense heat, and extreme cold; and be in safety against all their enemies. In a word, if *fowls* are not essentially necessary to the improvement of a farm, they offer, at least, a useful resource, and which deserves some attention.

Chickens hatched artificially.

When men had tamed those birds they had fixed on for composing their poultry-yards, after having forced *hens* to lay almost all the year round, by the stratagems which we have spoken of under the head of the *EGG*, they could then know how to value the immense resources they procured them, both in eggs, and in *chickens*; they of course, wished to increase these two products. This could only be obtained but by restoring to the *hens* their faculty of laying, which was withheld with them during the time of setting on the eggs, and that of rearing their *chickings*.

But how were *hens* to be replaced in these two important functions, and especially in the first?

They had seen that eggs deposited, and forsaken, in a place where a pretty high temperature was prevalent, and as equal and as constant as that which a *hen* could impart to them, that these eggs had hatched of themselves; that hence had resulted that in incubation the *hen* only served to transmit to them, the dose of caloric necessary to the developement of the embryos they contained; and that any other heat, provided it were exactly similar in energy and duration, would produce the same effect.

There now only remained, in order to create the art of hatching eggs without the help of *hens*, but to imitate the process which chance had pointed out, and which merely consisted in selecting a part in which eggs should receive the same temperature as under the female that had lain them, and during a time equal to that which

they would have stood in need of in order to hatch beneath her wings.

Nothing seemed more easy to find than the processes of this art. All nations were interested in the finding of them, and yet it is in Egypt alone where they have contrived such as were perfect enough for deriving advantage from them.

In fact, the ovens or hatches, invented by the priests of those parts, formerly yielded one hundred millions of chickens annually; and now that population is thinner, and that they are superintended by common peasants, the heirs to the secret of those ancient priests, they still yield thirty millions in the same space of time; whereas, among other nations, descending from the remotest antiquity to the present time, none but a few eggs, hatched from time to time, by methods different from those of the Egyptians are to be quoted.

There can, however, be no doubt but that the success obtained by the Egyptian method, successively excited the emulation of the Greeks and the Romans; but as neither of those two people were able to prevail on the Egyptian priests to reveal the secrets of their art; and that, moreover, as both were misled by the opinion they had formed, after Aristotle, that these Egyptian priests employed the heat of the dung-hill; it was in vain they made attempts; they proved too fruitless to prevail on them to set up such establishments as history can mention. They have only ended in leaving us a few receipts, too bad to deserve to be inserted here.

Under the reign of Augustus, Livy, that Emperor's wife, having found out that a man had hatched *chickens* by the mere warmth of his body, and by remaining in bed on the eggs during a time equal to that which *hens* take in incubation, wanted to try to hatch an egg by keeping it in her bosom: *out of it came a little cock, with a pretty comb.*

Nothing more was wanted to electrify every mind. They again set about finding the means of replacing *hens*, and of performing this operation on a large scale, and without employing the heat of the dung-hill. It appears that the efforts that were then made were more successful. They had in fact taken a much better way.

They imagined, says Pliny the naturalist, to deposit on straw, in a place warmed by a moderate fire, some

eggs, which a man now and then turned, and out of these came *chickens*, precisely on the same day as under *hens*. It is not known whether this discovery was for a long time taken advantage of; what we know is, that since this trial reported by Pliny, till beyond the time of the Crusades, not the least mention is made among the different nations, except among the Egyptians, of artificial hatching. But on the revival of Arts and Sciences in Europe, the Egyptian art itself is seen to be successively conveyed to Malta, Sicily, Italy, and from thence to France.

A Duke of Florence is seen to send to the village of Bermey for one of these heirs to the secret of the Egyptian priests, to superintend a chicken-oven; then a king of Naples, Alphonsus II, set one up in Portugal, his country residence; then a king of France, Charles VIII, had one built at Amboise (1); and lastly, another king of France, Francis I. followed the same example at Montrichard.

These numerous essays of the Egyptian method should have contributed to have made them been adopted in Europe; they did not, in all probability, answer well enough for to excite private cupidity, but were considered as a fresh means of amusement for kings, and not as an object of an advantageous speculation for subjects. However, as little folks are always fond of mimicing the great, people wanted also to amuse themselves in hatching *chickens*. They demanded,

(1) *Extract of an account under Charles VIII, 1496. Paid to master Nicolas Vicens, an Italian, for fourteen days, by him taken and employed for working an oven at the said place of Amboise, near to the said port, for hatching and rearing chickens without hens; which he has done for the said King's pleasure, during the above mentioned time, at the rate of 4 sols 2 deniers per day, and has been paid, as appears by his receipt, the sum of 58 sols 4 deniers.*

To the said, for the number of 1300 eggs by him bought at the above-mentioned time, in order to have them hatched, and to have chickens from the said, at the rate of 4 sols 2 deniers per hundred, has been paid in virtue of the said account and his receipt, 58 sols 2 deniers.

whether there did not exist means of performing the same thing on a smaller scale, and in a less costly manner. The learned of those days gave the old Grecian receipts, and about the same time, the Portuguese travellers made them acquainted with the manner employed in China. This consists in putting the eggs in a vase, burying them at the larger end in fine sand, covering them with a mat, and in placing the vase in an oven where a fire of lighted coals or turf is kept.

The industry of the French soon modified these processes. In fact, Oliver de Serres tells us of a little portable oven which was made of iron or copper, in which eggs were arranged, surrounded with feathers, and which was covered with a very soft cushion. To this oven was given a constant equal degree of heat, by means of four lamps that were always burning.

That patriarch of our agriculture, who found this oven more curious than useful, observes, that the *chickens* it yielded required more care than others, because they were weaker, more subject to fluxions and colds.

Reaumur's method.

We now come to that remarkable epoch when learned travellers are come back from Egypt, bringing with them accurate designs of the chicken-ovens, and the description of the processes that they had seen employed in that country; we come to that epoch when a celebrated philosopher had just invented the thermometer, that is, the most proper instrument for directing the temperature necessary to the operation of artificial hatching; Reaumur, undertakes to gather all the accounts of the travellers, to compare them one with another, to make them agree, to repeat all the processes of this art, in order to be able to establish it definitively in France. Unfortunately, errors had occurred in all the descriptions of our travellers, such errors as Reaumur and the other philosophers after him, mistook for defects in the art itself. Reaumur could not entertain a doubt of the successes that were obtained from it in Egypt; but he was persuaded, that they were owing to the temperature of the country; he was of opinion that it would be impossible to obtain similar effects in France, where the climate could not, as in Egypt, correct the pretended faults of the processes. Therefore, instead of following

his first intention, that of perfecting the Egyptian method, he sought for another. He found two, which he laid before the public as more convenient, less costly, and more sure than that of the Egyptians.

The first consisted in plunging upwards in a heap of dung in fermentation, some casks plastered inside, in which he placed eggs laid in baskets suspended; or again in covering, in burying in dung, some large, long cases laid flat, painted or tarred outside; lined with lead inside, having one end fixed in a wall, and opening in a room which this wall separated from the dung-hill.

It was through opening that he slid small carts on wheels containing the eggs.

He always kept in these horizontal ovens as in the vertical ones, thermometers for judging of the temperature that prevailed there, in order to know when it was necessary to heighten it or when to lower it.

The second method consisted either in making an hot-house, or stove, of the top of the different ovens that are constantly at work, such as baker's, pastry-cooks, &c. or in preparing rooms that be heated with a stove; observing, in the first instance, to modify the heat; in the second, to regulate the fire by the help of his thermometers, so that, during the twenty-one days, requisite for the incubation of *hen's* eggs, the temperature should not be lower than twenty-eight degrees, nor above thirty-four.

By dint of perseverance, address, and care, Reaumur has succeeded in making his processes answer pretty well; but they present so many inconveniencies and difficulties for the people who must naturally be entrusted with the execution of them; that since his death, no one has, as yet, thought proper to adopt them.

Copineau's Method.

The person that appears to us to have laboured the first in this sense, on this object, with most intelligence and sagacity, is the author of a work thus entitled, *l'Homme rival de la nature*.

Since the Egyptian priests, he has been the person best acquainted with the principles of the art, and who could lead it on most rapidly to perfection, had circumstances been favourable to his efforts. His *hatch* in particular is very ingenious. It is a round building, the

roof of which is arched, and has four triangular windows, each opening, when wanted, by the help of a cord that runs in a pulley; the entrance of this hatch is secured by two glass doors, one inside, the other outside; both, as well as the windows, are lined with slips of calf-skin; over the last door hangs a curtain made of a coarse woollen stuff. The outside of this little building, till within one-fourth of the top, is likewise supplied with woollen coverings; the inside is fitted up with circular shelves, on which the eggs are arranged, and which can hold as many as eight thousand; there is between each shelf, for letting in the air, four pipes opposite to each other, and which open and shut outwards; in a room below this *hatch* an oven is built, into which is buried, two feet deep, the base of a copper pipe filled with water heated to a proper degree by the fire of the oven; this pipe runs through the floor of the *hatch*, rises up inside, occupies the center, and goes through the roof.

The heat given by this column of water is more constant and regular than that which had been hitherto obtained. He moreover directs it by the thermometers; he moderates it in the upper part of the *hatch* by letting in the air when necessary, through the windows and through the pipes between the shelves. This heat in the lower part, where it tends to be less, is kept up by the thickness of the wall, by the woollen stuff wherewith it is covered. Lastly, in order to render it less drying, he has the attention to put in the *hatch* some water, the vapour of which being regulated by an excellent hygrometer of his own invention, renders the heat as damp as that which exhales from a setting *hen*.

Dubois' Method.

His processes are very plain, incur but a little expense, and can be put in practice in any place.

A small closet, similar to the apartment between two floors, ten feet long by ten wide, the ceiling of which should be very low, does the business of a hatch; a common sized door, covered with an old tapestry, serves for the entrance to this room, which is lighted by a little window, supplied with a sash, with four large panes of glass.

In the midst of this closet is a metal stove, whose pipe rises straight upwards, and goes on warming the room.

above; the inside of the stove is filled in the upper part with large clay balls, appointed to keep up the heat and to break off its vivacity outwardly; the stove is covered with crooked tiles.

Every five or six hours, two pounds of coals put in the stove, is sufficient to raise the temperature to the proper degree.

Iron tenter-hooks fixed to the ceiling, and so laid out as to form so many divergent rays round the stove, support wicker baskets in which the eggs are placed: each contains three hundred; they are suspended by means of cords that meet on an iron hook which allows them to be placed on the tenter-hooks, at different distances from the stove; each basket bears the date of the day when the incubation of the eggs contained in it began; it is at the end of four or five days only that the barren eggs are taken away; thermometers placed in different parts of the *hatch*, are a guide for keeping up the fire; the same service may be obtained by phials filled with a greasy fluid which cools when the temperature is below thirty degrees, and which Reaumur has contrived to form with a mixture of butter and tallow.

The same degree of heat is not alike in every part of the room, it is as high as thirty-two and even thirty-three degrees round the stove; but in the most distant part it is not more than thirty; it is still less in the lower region.

Dubois having found, that towards the twelfth or fifteenth day of incubation, that the heat should be lower than that which was given at first; he gradually lengthens the cords which keep the baskets suspended, in order to bring them nearer the floor, where the heat is less, and he successively draws them away from the stove, or he either places at that time the eggs in baskets laid one over the other, and at a small distance from the stove, being careful to move the eggs about several times a day, so that the sperm may be propelled successively to every quarter, and that every part of the egg may be heated alike.

Bonnemain's Method.

Bonnemain's hot-house is situated above the ground floor, it is twelve feet long by ten broad, and six high; there are in it four sets of shelves of four stories, one against the wall on the right, two in the middle, and one against the wall on the left; these shelves support drawers

having a bottom made of a light cloth, and, supported by cross wooden bars, and which is covered with a single layer of eggs; all the drawers together might hold as many as ten thousand. Under every drawer (they are all raised on legs) is a small leaden tub, full of water. Above each row of drawers run along, horizontally, six pipes, full of hot water; they are fixed to the shelves. These six pipes, in order to heat successively the eggs distributed on the four stories of the shelves, must run upwards at the extremity of the first, in order to recover the horizontal situation above the second row of drawers, then above the others, and afterwards to go and empty themselves in the upper widening of a pipe, which brings back the water to the vessel which had supplied the pipes of the stove with it.

This vessel is in a room under the hatch; it is formed of two cylinders soldered together, each is three feet high; one, which is outermost, is seven feet and a half in circumference; the other, which is innermost, is only eighteen inches in diameter; they are both equally terminated by a truncated cone. The space between the two cylinders gives this vessel a pretty large capaciousness for holding water; and the cavity which the second cylinder presents, makes it fit for performing the office of an oven; to this effect there is a grating fixed inside, at that part where the base of the cone begins. With a view of rendering the fire made on that grating more durable, Bonnemain turns over it a cylindrical copper box full of coals, and which is closed at its upper part by a luted lid, that is, he makes an athanor of his oven. And to have a more uniform temperature, he stops up the extremity of the cone which receives, and through which the ashes are taken away, and he adjusts to a lateral door placed lower than the grating, the fire-regulator, which he has invented, and which every body is acquainted with.

Things being so settled, Bonnemain selects the newest eggs he can find, those that have not been shaken about; those with the least vacancy, and which do not change place; those coming from *hens* having vigorous *cocks*; those especially that have been taken out of the baskets as soon as they have been laid; and without waiting till the stay that each *hen* makes to lay in the common nest, has given to the sperm of the first eggs that motion of life which it is dangerous for them to have received when it is not to be immediately acted upon by an incubation.

continued throughout the whole of the time. Bonnemain exposes these eggs to a temperature of 15 or 16 degrees, and afterwards places them in the drawers of his hot-house, already heated at 32 degrees, by the help of the water in circulation in the pipes we have spoken of. Notwithstanding the temperature to which these eggs are raised before they are introduced into the hot-house, they get covered, immediately on their entrance, with a damp vapour, which goes off at the end of twenty-five or thirty minutes only, and which shews that the air inside is not too much dried up. Two or three days after the introduction of the eggs, Bonnemain looks at them at the light, and finds by a wavering shadow that they are fecundated. At the end of ten days he finds, by the warmth generally diffused in the eggs, that the sperms are alive. He often turns the eggs about during the time of incubation, but he helps the *chickens* as little as possible to get out of their shells; he believes that the necessity of relieving them in this circumstance should let us know that he has operated not like *hens* that have themselves chosen the place that suited the good success of the operation, but like those that have been obliged to set in that place, and after that mode willed by man, much less informed than her on that matter.

Bonnemain's hatch seems more complicate than the former, but it is, however, more easy to manage; it has four remarkable advantages over them.

1st. That of a heat rendered infinitely more constant by the help of his regulator.

2d. That of damp heat more perfectly similar to that of the setting *hen*.

3d. That of applying constantly this heat to the surface of the eggs, that is, of applying it almost immediately to the sperm of the eggs themselves, which appear as being by nature so intended to be always directed, so as to receive thus the warmth of the *hen*.

4th. That of not producing so great an evaporation of the liquids contained in the eggs, whence it does not occasion any hindrance to the exclusion of *chickens* not kept back in their shells by the remains of the dried white of egg.

To the processes of Reaumur, Copineau, Dubois and Bonnemain, we could again join many others which have been contrived in France, but this is enough to have an idea of the efforts performed for establishing in that country an art capable of rivalling with that of the Egyptians.

All these processes have answered more or less. Some few *chickens* have issued from the different establishments where they had been put into practice; but, we must confess, that the quantity of *chickens* that have been hatched therein, is hardly greater than that obtained by the Greeks and the Romans; it is nothing in comparison to that which annually issues from the hatches of Egypt, and we shall ever have to regret that our literati, instead of wishing to invent a new art, did not rather study how to bring that of the Egyptians to a greater perfection, and to adapt it to our climate. Had they found by experience that it could not answer in that state in which it is exercised in Egypt, our regrets will be still much more greater when that work on Egypt, which is now preparing, will inform us, that it is not so defective as it has been imagined, on the false reports of travellers. When it will be seen that it is not impossible to introduce it in France, such as it is, without wanting any improvement, as one may judge by the extract that I am going to give of my correspondence with M. Boudet, chief apothecary to the army of the East, and that of M. Rouyer, one of the first apothecaries of the same army, both uniting the talents for accurate observation.

Egyptian Chicken-ovens, or Hatches.

They are buildings made of bricks unburnt, but dried in the sun: a faithful and exact account of their construction and dimensions may be seen in the works of Vesling, Niebhur, and other travellers. The inside of these buildings is divided longwise, in two parts, by a gallery, or passage, that separates two parallel rows of ovens, consisting of a number that varies from three to eight on each side. Every one of these ovens is on a double range; the upper room has a door that opens in the passage; a hole at the roof, which is opened and shut at pleasure; lateral windows, that are never shut, and which communicate with the upper rooms of the adjoining ovens; a circular opening in the centre of the floor, through which one may go down into the lower room, and around which is contrived a trench, or furrow, for receiving and containing lighted coal, &c. the heat of which is imparted through the opening above in the lower room. This last has, like the first, a door that opens in the passage. It is on the floor of this room that the eggs are placed.

In the front of the chief building, of which these ovens make a part, are several small buildings; one of them, which is not so large as the others, serves as an oven for turning the turfs of dung into fuel, for divesting them of the faculty of spreading in the ovens where they are put, a smoke that would injure the eggs: another place is for receiving the *chickens* that are to hatch: in a third are deposited the eggs that are to be put in the ovens: the fourth is a dwelling for the people entrusted with the management of all the operations of the hatch.

The buildings that constitute the ovens and all their appurtenances are always built on the ground floor; one is never obliged to go down in order to enter into them, only they are pretty generally built against small hillocks that frequently occur in Egypt, and which are formed near towns and villages, by removals of earth, which, in that country, one is obliged to heap up in certain parts, because, were they to be scattered as elsewhere, they would make the land uneven, and render irrigation difficult, and even sometimes impossible.

Working of Chicken-ovens.

Towards the middle of January, the ovens are inspected and repaired; and as they are public, and as each has a circuit of fifteen or twenty villages, notice is given to the inhabitants, so as they may come and bring them eggs.

As soon as a suitable quantity is collected together, it is put in the rooms that are to serve for the first brood: it is to be remarked, that the whole of the ovens are never employed at once on the same brood, but only one half of those which the building contains, and that, if there happen to be a dozen, for instance, they are taken in the following order: the first, the third, the fifth, the seventh, the ninth, and the eleventh.

The eggs ranged three deep in the lower rooms of each oven on a bed of chopped straw and dust, which mixture Aristotle has probably mistook for dung: the lighted fuel, resulting from the combustion of the turfs of dung, are drawn out of the oven where we said it was prepared, and placed in the furrows or trenches of the upper rooms.

After a few moments both doors of the place are shut, and only the opening that are in the roofs of the upper chambers.

The fuel burns away, it is renewed two or three times

a day, and as many at night, with the same precaution each time to unstop for a moment the hole in the roof, both for the purpose of refreshing the air, and keeping the eggs from the first impression of heat.

The fire is thus continued during ten days; a long experience, a skilful hand, the application of the eggs against the eye brows, these are the thermometers used in Egypt for directing it, for having always the same temperature.

During that space of time, the eggs are often turned, they are examined, those that are stale or clear are thrown aside.

On the eleventh day, the second brood is forwarded, that is, fresh eggs are placed in the inferior cells of the six ovens left empty at the first brood, and the furrows of their upper cells are filled with lighted fuel.

But as soon as the fire is alight in these ovens, it is put out in the others, so that the eggs of the latter are no longer heated but by the fire lately made in the former, and only receive heat but by the lateral windows, which we have said were in the upper chambers of the ovens, and remained constantly open.

The second brood being so got forward, they take from the lower rooms of the ovens first used, one half of the eggs, to lay them out on the floor of the upper rooms; this change is made, because these eggs require the greater care the nearer they draw to the time when the *chickens* are to issue from them; they may be inspected, turned, taken up with greater ease.

When the twentieth day of incubation is arrived, some *chickens* are already seen breaking their shell, the greatest part issues on the morrow, with or without help; but few wait for the twenty-second day.

The strongest *chickens* are taken to the room allotted for receiving them, for to be distributed to those who have furnished the eggs, and who obtain two for three; the weakest are kept for a few days longer in the passage.

This first brood being over, the third is set about, when the same is done with the second as with the first, which is, that in the ovens No. 2, 4, 6, 8, 10, 12, a part of the eggs are turned out, the fire is extinguished, and no more heat is received there but that which is imparted to them by the ovens in odd numbers, whose turn it is to have the fire in the furrows of their upper rooms, and during the ten first days of the incubation of the eggs.

The same is continued to be done with all the successive broods that take place in the brooding season.

After this description of the processes practised in Egypt, we believe that the successes attending them will no longer be attributed to the goodness of the climate.

In fact, instead of a sudden blaze, spoken of by our travellers, instead of that large, momentary flame, capable of diffusing an irregular warmth, and, as Copineau says, of causing a flow and ebb of perpetual variations, nothing is seen but fuel, which gives no flame; instead of a combustible yielding that enormous quantity of smoke, which, as they said, smothered all the ovens, and which must have penetrated the eggs, destroyed the sperm, blinded all the persons busied in the management of them, it turns out to be nothing more than a half-consumed substance, put in a state of no longer being able to give any smoke; and we learn, that all what travellers have perceived above the ovens, busy at work, issued only from the oven that was solely employed to keep them from it.

In fine, instead of that heat, impossible to be conceived, which, being kept up during the ten first days, without being able to pass much the 32d degree, still kept in, said they, without any fuel, during the eleven last, so as to procure the same temperature, one sees the eggs warmed during the whole time of incubation, by a fire constantly kept up to the same degree, only one has thought proper to keep it nearer the eggs the ten first days, and remove it farther off the eleven last.

The only objection of any weight, is that which has been made against the lowness of the inner parts of the ovens, which must render the daily operation of turning and changing the places of the eggs very painful, but that inconvenience could be remedied here, it is not, besides, one in Egypt, where, the inhabitants writhe and wrest themselves about easier than our Europeans.

Chickens reared without the help of Hens.

It is not enough to hatch *chickens* without the assistance of *hens*, they must still be reared without them.

In this last part of the art more or less difficulties occur, according to the climate, or the season, when it is to be performed.

In Egypt, it is not the Bermians, the directors of ovens, who take this care.

Almost as soon as the *chickens* have issued from their shells, they are given back in flocks of four or five hundred, to those who have furnished the eggs, and the women in each house undertake to rear this quantity of *chickens*.

In that country, where it scarcely ever rains, the houses, instead of roofs, have terraces, or flat roofs, edged with small walls, four or five feet high. It is in this enclosure, on the surface of which a layer of fine mould is spread, that the *chickens* pass the day. They are watched, in order to be kept safe from hawks, and to be fed with corn, millet and bruised rice.

When night comes on, they are cooped in pens made of palm-tree branches, and lined inside with coarse cloth, and they are taken in doors.

A month is sufficient for putting them in a state for being admitted into the poultry-yard.

In our climates, when the *chickens* are hatched, they stand in need of being left four or five days in the hatch, exposed to a temperature nearly equal to that which was necessary to the incubation of the eggs; they must still have artificial mothers; these are a kind of low cages, lined inside with sheep-skins, and so laid out as to render the *chickens* the same services as they would receive in hiding under the wings and belly of a *hen*.

At the expiration of the four or five first days, they are taken along with their cages to a room that faces the south, and is warmed by a stove, built and so supplied, as to keep up a heat of eighteen to twenty degrees; or again, in following Bonnemain's mode, they are put in a place where four pipes fixed under boards run along at equal distances, and a very little above the ground; to these pipes, filled with hot water, are fastened loose flannels, and loaded with a light weight, so as to present the *chickens* with a soft body, that can warm their back chiefly.

In one or other of these hot-houses, the *chickens* lie close together, or run about at pleasure.

There, in order for them to be kept clean, the ground is covered over with a layer of fine gravel, which receives the excrements, and which is every day swept away with a broom; the artificial mothers are cleaned, the skins beat, the wool combed, the *chickens* that are dirty are washed in warm-water, the walls white-washed with lime or lined with mats.

There, in order to make them more healthy, the air

should be always renewed: this same purpose would be completely answered, by leading the pipe of the stove in a kind of chimney, the lower opening of which, beginning on a level with the ceiling of the room, would present an extensive issue to the air which it contains: and, in order that the fresh air coming in from without, to replace it, should not produce cold, it would be proper to bring it in through a reservoir contrived in the stove, whence it would be diffused over the place through warm apertures.

There, in order to get strength, they should have a place to run about in; it is a little piece of ground adjoining the hot-house, a little enclosure, where the *chickens* are let in to play in the sun-shine, and to get insensibly used to the impressions of the air.

There, lastly, they are fed with food adapted to their age: at first, the crumb of bread moistened with a little wine, crumb and hard eggs, crumb and millet; then a paste made with bruised barley and boiled potatoes, to which is added, the offal of the kitchen, bones coarsely ground, hashed leeks, &c. &c. the whole being put in troughs, drawers, mangers, &c. thoroughly cleaned, as well as the vase that contains very clear water, and which is so contrived, as to allow the *chickens* only to put their head and neck through to drink.

During the second month, the warmth of their hot-house is diminished; they are left in the open air for a longer time, and their artificial mothers are taken from them.

At the end of the third month, they are fattened in ten or twelve days, in pens, with a paste made of a mixture of two parts of the meal of buck-wheat, one of barley-meal, and as much of oat-meal; this mixture being well knit together with water, or still better, with milk.

The largest and best are kept back for making *capons*, or *hen-capons* of, the liveliest and strongest for keeping up the poultry-yard.

Advantages of the Artificial Methods.

To set a proper value on them, it will be sufficient to consider the results they give both in Egypt and in France, and to compare them afterwards to those obtained by hatching in the natural way.

In Egypt, the ovens yield constantly more than two thirds in *chickens*, since the manager of an oven always gives back two thousand *chickens* for three thousand eggs he has received, and that he contents himself with the salary of the *chickens* that hatch out of the third thousand.

In France, it might be very possible to obtain an equivalent produce, since Reaumur, notwithstanding the faultiness of his method, depended on the success of two thirds of the fecundated eggs; and that one time he has had ninety-six *chickens* hatched out of three hundred eggs put into one of his vertical ovens; since Bonnemain, when he practised on the eggs of his *hens*, had almost always as many *hens* as he had put eggs into his hatch.

Now every body knows, that the breeder that puts his *hens* to set, in general finds himself very fortunate when he finds one half of his brood to answer, it being so common to meet with bad setters. Indeed, some break the eggs in setting down too heavily on them; others, break them in wanting to change their places; some eat them; some, after setting a certain time, give them up; there are some that, after having carried on the broods till just the time, grow impatient, open the egg by striking it with their bill, and kill the *chickens* ready formed.

There are some, again, that stifle their young on their issue from the shell, through too much affection.

So many advantages on the one hand, and so many inconveniencies on the other, should induce Europeans to redouble their efforts to form such establishments, as may bear the competition with those of Egypt.

Let us pray for seeing another Reaumur appear again in France. A learned and rich land-holder, zealous for the interest of his country, who would examine all the processes of the art of hatching and rearing *chickens*, would bring this art to perfection, would teach it to the inhabitants of the village adjoining his establishment. These peasants would soon all become as dexterous managers of ovens as the Bermians; which would not be more difficult for them, than it is for the inhabitants of Montreuil to become good gardeners.
(PARMENTIER)

Various Breeds and Varieties in the Fowl Species.

We have given an account of the *wild fowl*; from that primitive stock different breeds have sprung, which have perpetuated themselves. On the other hand, the diversity of climates and food have produced in these same breeds a number of varieties, which the naturalist may think beneath his notice, but which are not destitute of interest in the eyes of domestic economy, and of curiosity. These particulars, besides, are too nearly related to the history of agriculture. Even so, and more so than in all the species of animals subdued by a long domestication, the *fowl* species frequently exhibits individual alterations and monsters. It is not a very uncommon thing to see four-winged or four-footed *fowls*, &c. One of the most singular of such alterations is that which M. Schwartz, counsellor of regency of the king of Prussia, has given an account of last year (1803) in a periodical work, entitled, "*Brennus*," printing at Berlin. "A Jew," says M. Schwartz, exhibited in 1802, at Posen, in Poland, for money, a *fowl* with a human face, which was hatched in a farm near Wryesnier, and which had been given to him in payment for a small debt." He asserted, that another *fowl*, quite similar, had come from the same brood, but that it died soon after its birth. The animal he shewed, and which I have seen myself, was alive and in very good health; it had come to the whole of its natural size, for it was then more than a year old; its body was covered with feathers of different colours, and it was like all other *fowls*, the head excepted. This latter part was of the usual size, but without feathers, and covered with a bluish skin. The cavities of the eyes had entirely the shape of those of the human eyes; they were surrounded by two small arches of a fine down, which formed very regular eye-brows. The upper part of the bill was shorter than usual; it only had a blunt point, and the nostrils were below; so that, although it was horn, it was exactly like a nose, a very well shaped nose too. Beneath this nose, a very regular mouth, with lips, two rows of very white, very close, and pointed teeth, and a rounded tongue, completed this singular sport of nature. The resemblance it bore to the human face had something disagreeable and even frightful in it; but it was perfect, and did not, in the least, want the help of the imagination to be recognized.

It also sometimes happens that in moulting, which usually lasts six weeks, or two months, the new feathers of *fowls* change to a colour different from that of the old ones. Buffon quotes an observation of this kind made on a *hen*, and on a *cock*, and I myself have had in my power to remark a similar change on a *hen* of my poultry-yard. This bird was born entirely black, and remained so till its first brood; but, on moulting, it became quite white. The following year black feathers made their appearance again; it then changed to a cloathing, varied with white and brown, which has remained: its legs were constantly yellow.

THE ADRIA FOWL. The ancients so named a dwarf breed, which they got from the environs of Adria, a town in Italy, which had given its name to the Adriatic Sea. Aristotle speaks in high terms of the fecundity of these *fowls*; they lay, says he, every day, and sometimes two eggs a day.

THE AGATE FOWL. A variety of the breed of *tufted fowls*, the colour of which imitates that of the agate.

THE ALEXANDRIA FOWL. The ancients mentioned it as one of the finest breeds: it now has nothing remarkable in it.

THE SLATE-COLOURED FOWL. which is also called *tufted slate-coloured fowl*.

THE SILVERY FOWL. This is the name which the curious have given to *tufted fowls*, the plumage of which exhibits spots regularly distributed, and of a very clear white.

THE BAHIA FOWL. A large *fowl*, which only gets covered with feathers but when it has come to the half of its size; one may, with every appearance of reason, refer it to the *Caux* or *Padua fowl*.

THE BANTAM FOWL. (*Phasianus pusillus*, Lath.) A pretty variety, the legs of which are covered with feathers, till the beginning of the claws, but on the outward side only; those on the thighs are very long, and form kinds of bunches, which descend much lower than the heel: the irides of the eyes are red.

The Bantam Cock is very courageous; he is willing to fight against cocks twice his size.

THE BRESSE FOWL. A breed similar to the *Caux*, and which supplies *capons* in repute among gluttons.

THE CAMBOGE FOWL. This is a breed which is not larger than the common *pullet*, but the legs of which

are so short, that the wings drag the ground; it therefore walks always in a jumping way. It is very fruitful, like the other breeds of *dwarf fowls*.

THE CAUX FOWL. (*Phasianus Patavinus*, Lath.) It is almost twice as large and bulky as the common *fowl*, from which it does not otherwise differ. The *chickens* of this breed get their feathers later than those of the common breed.

THE CHAMOISE FOWL. *Tufted fowl*, of a chamoise colour.

THE FIVE-CLAWED FOWL. (*Phasianus Pentadactylus*, Lath.) The character of this breed is having five claws to each foot, three before and two behind.

THE COMMON FOWL. (See FOWL). This is the breed that proves most profitable, at least in our countries: it is therefore that which is generally preferred. Its plumage exhibits numberless varieties, which also differ among themselves by the colour of the legs, some having them black, others blackish, others yellow, &c. Experience has taught us that *common fowls* with black legs are preferable for the product.

THE CHALCIDIA FOWL was very famous with the ancients.

THE FIRE-COLOURED FOWL. A variety of the *tufted fowl*.

THE HALF-INDIA FOWL. The Dutch have given this name to a breed of *fowls*, peculiar to the Isle of Java, and the males of which carry their tail something like the *turkey*. These *cocks* are seldom bred but for fighting.

THE GOLDEN FOWL. A variety of the *tufted fowl*, the spots of which shine in the sun like gold.

THE DOWNY FOWL OF JAPAN. (*Phasianus tanatus*, Lath.) The feathers, having webs with no adhesion to one another, have the appearance of down, or rather of hair, whence the name of *silken* is also given to it. This *fowl* is white, and is about the size of the *common fowl*; it has feathers on the legs, but only outwards, till the beginning of the claws, and on the outward claw to the nail. It is found in Japan, China, and easily answers in our climates. This is the breed which gave rise, in 1776, to the fable of the *rabbit-fowl*, which was shewn at Brussels, as the produce of a rabbit and a *common hen*, and which was merely a *downy fowl* of Japan. I then saw Buffon for a long while teased by the letters of two

pretended observers of Brussels, one of whom was a prebendary, and the other a Jew merchant; they were continually writing to him, in order to convince him of the existence of the *rabbit-fowl*. Buffon had answered several times by arguments that proved the impossibility of the fecundity of such a disproportioned connexion. Their credulous obstinacy at last put him out of temper, and he silenced them by a joke, too bad to be inserted here, but which rid him for ever of the importunity of the Jew and the prebendary.

THE FISH-SCALY FOWL, a *tufted fowl*, with spots in the shape of fish-scales.

THE FLECHE FOWL. (See CAUX.) The *capons* and *hen-capons* are very much esteemed.

THE FRIZZED FOWL. (*Phasianus crispus*, Lath.) This breed, more singular than agreeable to the eye, has all its feathers turned upwards, and in a manner frizzed; it is of all sorts of colours; *fowls* of this sort are seen white, black, silvery, golden, slate, &c.

The *frizzed Fowl* is found in Java, Japan, and in all southern Asia; it dreads the cold, and the chickens seldom hold out against our climates.

THE HAMBURG FOWL has a very pointed bill; a circle of brown feathers round the eyes, the irides of which are yellow; a tuft of black feathers on the ears, behind the comb, and below the wattle; large black spots on the breast; the belly and thighs of a velvet-black; hence it has also been called *velvet-breeches*; the legs lead colour, beneath yellowish.

THE ERMINED FOWL, a *tufted fowl*, and spotted like ermine.

THE TUFTED FOWL. (*Phasianus cristatus*, Lath.) The feathers of the crown of the head are longer than the others, and their assemblage forms a tuft or bunch, the colour of which, as also the shape, are very variable; the comb is usually smaller than in the other breeds; there are even a few individuals which are absolutely deprived of it, as also of the wattle hanging beneath the bill.

“As for the rest,” says Buffon, “the breed of *tufted fowls* is that which the curious have mostly cultivated; and, as it happens with all things that are closely looked into, they have remarked a great number of differences in them, especially in the colour of the plumage, after which they have formed a multitude of diverse breeds,

which they esteem the more, when the colours are more beautiful or more rare."

Of all these breeds of *tufted fowls*, those preferred by the curious are the white ones with black combs, and the black ones with white combs; but if a poultry yard, stocked with these handsome fowls, pleases the eye, it is not so profitable in our climates as one stocked with *fowls* from the common breed, because it yields a lesser quantity of eggs. It is again pretended that *tufted fowls* take the fat better and easier than the others, and that their flesh is more delicate.

I shall remark by the way, that according to Pliny, it was the inhabitants of Delos who first fattened fowls; 'tis from them, says that elegant historian, that the rage of devouring birds loaded with fat, and watered with their own substance, was propagated like a contagion.

THE ENGLISH TUFTED FOWL does not surpass our's in size, but it stands much higher on the legs. The *cock*, which has rather an aigrette than a tuft, and the bill and neck of which are of a more open shape than in the common breed, is superior to our's for fighting.

THE WHITE TUFTED FOWL. Aldrovandus gives the figure of a *tufted fowl*, the plumage of which was entirely white, and the tuft similar to that of the *crested lark*.

THE ITALIAN FOWL. This is the name given in Germany to the large breed of *Padua*, or *Caux fowls*.

THE ISTHMUS OF DARIEN FOWL. A small breed of *fowls*, that has, according to *l'Histoire générale des Voyages*, a circle of feathers round the legs, a very bushy tail, which it carries straight, and the tip of the wings black.

THE JAGO FOWL. This may be regarded as the giant breed among the fowl species. Its dimensions are very remarkable; it stands so high on the legs, that it can reach food placed on a dining table. Marsden, who reports this fact, adds another, which seems not so likely. "When this animal is tired," says this traveller, "he rests on the first joint of his legs, and it is even then higher than the *common cock* on his legs. (*Hist. of Sumatra*.) This extraordinary breed is found in the southern extremity of the Isle of Sumatra, and in the western part of Java. The name of *Jago* is also applied in this last isle to the *Bantam fowl*.

THE JAVA FOWL. A singular breed of *fowls* which

partakes of the common *fowl* and the *India fowl*; "They are," says Mandelslo, "in a manner monstrous, and so furious that they sometimes fight together till the death of one or the other separates them." (*Voyage aux Indes*.)

These *fowls* have no comb nor wattle; their head is smooth like the *pheasant's*; their legs are very long, as is also their tail, the quill-feathers of which are of unequal length, and which ends in a point; their plumage is darkish, like the vulture's.

It is very probable that this race is the same as that of the *Half-India fowl*; a few live ones were to be seen at Paris, about thirty years ago.

THE WOOLLY FOWL. The same as the *downy fowl* of Japan.

THE LOMBARDY FOWL. A very small breed of fowls, which some travellers have spoken of as being natives of the isle of Madagascar, where it is called *acohó*.

THE MAN'S FOWL, the same as the *Caux fowl*. A great consumption is made of the good *capons* and excellent *hen-capons* it supplies.

THE MEDIA FOWL, which commentators have improperly termed *Melos fowl*, by reading *Gallus Melicus* for *Gallus Medicus*. A large stout race, the males were accounted courageous by the antients, but the females of which were not productive.

THE MELOS FOWL, improperly taken for the *Media fowl*, which see.

THE ENGLISH DWARF FOWL. A very small fowl, which has been greatly multiplied in England, because it is very fruitful and excellent for setting; it is preferred in *pheasant* walks to the *common hens*, which are too heavy. When the breed is pure, the plumage of this fowl is quite white; it is not larger than a middling sized pigeon.

THE CHINESE DWARF FOWL. Smaller than the *English Dwarf Fowl*; its plumage is varied on the different individuals like that of the common breed. The painting of them is frequently to be found on China papers.

THE FRENCH DWARF FOWL. A small breed of fowls, not so small, however, as the *English dwarf fowl*. Its plumage varies like that of the common breed; its legs are very short, and its eggs are not larger than a pigeon's.

THE JAVA DWARF FOWL. (*Phasianus pumilio*, Lath.) It is not larger than a pigeon; it is perhaps the same as the *Madagascar fowl*, and as the *English dwarf fowl*.

THE LARGE FOOTED DWARF FOWL is not larger than the common *pigeon*; the plumage is sometimes white, at others white and golden.

THE LARGE FOOTED ENGLISH DWARF FOWL. This pretty variety of *large footed fowls* is hardly larger than a *pigeon*; its plumage is golden and its comb double.

THE NEGRO FOWL, (*Phasianus niger*, Lath.) This differs from all others as it has the crest, the wattle of the bill, the epidermis, and almost always the feathers, of a black colour; the plumage is sometimes white. It is common in Java, the Philippines, in some southern parts of Asia and of Africa. It is also reared in France, but merely out of curiosity; for when its flesh is dressed, it turns black and is ill-tasted, it seems as if it were boiled in ink.

From the mixture of *negro fowls* with the other breeds, arise mongrels, which usually retain the black crest and wattle.

This breed of black *fowls* has been carried to, and has increased in the hot parts of America. "In Paraguay," says M. d'Azara, "Buenos-Ayres, and in the Cordilleras of the Andes, there are tame *fowls* of common and other breeds, which do not differ as to the shapes, and which have their feathers, legs, comb, wattle, and skin black as the negroes of Guinea. When dressed, their skin is still black; their flesh is more insipid, and of a darker colour than that of the common *fowl*, and their bones are plainly more opaque; they reproduce, and intermixed with the common breeds they make mongrels. Their eggs are white, and some people value these *fowls* because they are said to be more fruitful, and their flesh accounted more fit to be given to sick persons; they probably descend from the common Spanish or Canary breeds, brought by the conquerors. *Essai sur l'Hist. Nat. des Quadrupeds du Paraguay, trad. Fran. tom. ii, pp. 320 et 324.*

THE PADUA FOWL, the same as the *Caux fowl*.

THE ENGLISH LARGE FOOTED FOWL (*Phasianus plumipes*, Lath.) A variety of *large footed fowls*, distinct from the *bantam fowl*, and which is larger than the French one.

THE FRENCH LARGE FOOTED FOWL. Its legs are covered with feathers as far as the claws. The greater part of the *large footed* breeds have no tuft.

THE SIAMESE LARGE FOOTED FOWL. It is white, and smaller than the common fowl.

THE PEGU FOWL. This is most likely the same as the *Caux fowl*.

THE SMALL PEGU FOWL is not larger than a turtle-dove; it has a very handsome plumage, and scurfy legs, say some travellers.

THE PERSIAN FOWL. This name is sometimes given to the *fowl without a tail*.

THE FOWL OF THE PHILIPPINES. Independant of the *Camboge fowl*, which the Spaniards have taken to the Philippines, there exists in these islands another breed, that goes by the name of *Xolo*, and which has very long legs. Perhaps this breed, concerning which we have no particulars, but an indication by Gemelli Careri, is not different from the *English tufted fowl*.

THE STONE COLOURED FOWL. A tufted *fowl*, the plumage of which is a white ground, dotted with black, or chamoise, or slate colour, or golden.

THE RHODE FOWL. A large breed very much esteemed by the ancients. The *cocks*, stronger than the others, were kept for fighting; but these birds, which had so much ardour to fight, had very little for their mates; three *hens* only (instead of 15 or 20) were enough for one *cock*; and the *hens* were also less fruitful, and not such good setters as the common *hens*.

One may venture to affirm that the *Rhode fowl* is the same as the *Caux or Padua Fowl*.

THE FOWL WITHOUT FEATHERS. With the exception of a few feathers on the wings, one can hardly find twenty more on all the rest of the body of this fowl. It is not certain whether it be a particular breed. Some say it reproduces, and that every individual arising therefrom, without an intermixture of other breeds, are equally naked; others pretend that this nudity is nothing but artificial. Some common *fowls*, as they say, are cooped up in a mild place, and their feathers are plucked as fast as they grow; they never return.

THE FOWL WITHOUT A TAIL, (*Phasianus ecaudatus*, Lath.) It is also named *Persian fowl*. This breed is not only deficient of a tail, but it has no signs of a rump; a small hollow is to be seen in its stead. It re-

resembles in size and varieties of colours of its plumage the common *fowl*; they say, its bill and legs are always blue.

It is looked upon to be a native of Persia. Guenau de Montbeillard, who has done some fragments of the natural history of the *cock*, in Buffon's works, thinks, on the contrary, that it is from Virginia, whence this breed has sprung. He grounds his opinion on the one hand on what is reported by the Philosophical Transactions of 1693, that when *fowls* are led to that country, they soon lose their rump; and on the other, on naturalists having only began to mention *fowls* without tails till after the discovery of America. I am not of that opinion, which to me appears not admittable. In fact, modern travellers have not confirmed the loss of the rump which the English *fowls* experience in Virginia, and it is positively known, that in the other parts of America, in the hottest even, this privation does not take place.

The similarity which Guenau de Montbeillard endeavours to establish between the breed of *fowls without tails*, and that of dogs without tails, appears to me to have no foundation. I am certain, because I have seen it, that a dog is sometimes born entirely destitute of a tail in the midst of a litter of dogs with tails.

'Tis said, that when the breed of *fowls without tails* intermixes with the common breed, that it gives rise to mongrels with only half a rump, and six quill-feathers to the tail, instead of twelve.

THE SANSEVARRE FOWL. Tavernier has seen this *fowl* in Persia; it is a very large breed, the eggs of which sell for three or four crowns a piece, and which the Persians amuse themselves in knocking one against the other, as children do in our countries with red eggs. A fine *cock* of this breed sells in Persia, according to the same traveller, as high as three hundred livres.

THE WILD FOWL, see the word **FOWL**.

THE WILD FOWL OF ASIA. This is the primitive stock of all the breeds of *fowls*. See **FOWL**, for the description of this bird.

THE SIX CLAWED FOWL, a variety in the breed of the five clawed *fowl*; it has six, three before and three behind.

THE TANAGRA FOWL. The inhabitants of Tanagra, a principal town of Beotia, reared, according to Pau-

sanias, Pliny, and other authors, *fowls*, the breed of which was no where to be found but in their country.

"I have seen at Tanagra," says Pausanias, "*cocks* of two species : those of one sort that love to fight like the common *cocks*, and the others, which are named black birds. These last are of the size of those Lydian birds ; their flesh is as black as a crow, the comb and wattle of an anemony colour, the tip of the bill and of the tail dotted with white. This is nearly how they are made."—(*Voyage de la Béotie*, liv. 9, *traduction de Gedoy*n).

I can hardly think that this last breed, compared with the black bird, be really a breed of *fowls*. However this be, the ancients greatly esteemed the Tanagra *cocks*, because they were very fit for fighting.

THE FOWL ALL BLACK. Besides the negro fowl, there exists in some parts of Africa, and at Sumatra, another breed still blacker, since its very bones are black as jet.—Marsden (*Hist. of Sumatra*,) makes the distinction of this *fowl*, with the *negro fowl*, which is equally found in the island, of which he has written the history.

THE TURKEY FOWL, (*Phasianus Turcicus*, Lath.) differs only from the common *fowl* in the variety and beauty of its plumage. It usually has a whitish body, with brilliant strokes, which look like gold and silver ; the wings in part blackish : the tail composed of green and black feathers, and the legs bluish. Some individuals have, growing behind the comb, a small white tuft, similar to that of the *lark*.

THE WIDOW HEN. Small white dots, strewed on a dark ground, have made this name to be given to a variety of tufted *fowls*.

Note. That a great number of birds mentioned by travellers by the name of *cocks* and *hens*, are quite of another species, and even quite of another genus (S.)

EGGS.

Birds, instead of giving birth as *mammiferous animals*, to living beings, produce organic bodies, which have an elliptical form more or less lengthened. These bodies are named *eggs*. The birds which lay them are oviparous animals, and *ovary* is the term given to the organ where

these eggs form themselves. Eggs may be considered as wombs, containing not only an embryo, but moreover the quantity of food which the little bird that is to be born will stand in need of, when, by the effect of incubation, it will come to its developement and growth. The shell, which is the most outward part of eggs, is usually white, it is hard, fragile, porous. It allows itself to be penetrated by the moisture which comes from it, and by the air which replaces it; it is composed of a great quantity of phosphate of lime; the particles of these two substances are united by an animal glue. Under this shell or rind, it applied a thin, flocculent, transparent membrane, of a close contexture, which incloses—

1st. A viscid, tenacious, limpid humour, known by the name of *albumen*, and vulgarly by that of *white of egg*.

2d. A globulous body, swimming in the midst of this humour, and having a soft consistence, a yellow colour, whence it bears the name of *yolk or yellow of egg*.

3d. A small white body which is found placed at a point of the membrane that surrounds the yolk; this little body bears the name of *cicatricula*. It contains the sperm in which this secret agent resides, which, with the help of favourable circumstances, is to animate it and transform it into an organized body.

Examination of these Substances.—On examining the albumen, it is perceived, that it is not homogeneous, that it is possible to distinguish three different ones, one that is more external and more liquid than the others, especially in new-laid eggs; another more abundant, more consistent than the first; lastly, a third which, occupying the interior of the second, presents, like two insulated bodies, although united by a very thin albuminous cord: these bodies, which are known by the name of *chalazes*, are equally consistent; they are not situated at the two poles of the yolk, as all physiologists have thought before Lévillé; but they divide the circumference of this globe in two segments of a circle of a very unequal length.

Each portion of this last albumen is crossed by a cord twisted upon itself, the one of which is membranous and the other vascular. The first is contiguous to the pellicle of the yolk; the second, figured like an umbilical cord, is continuous with this pellicle, makes one body with it,

and discovers to us the point of communication between the yolk and the albumen.

The examination of the yolk will inform us that its shape depends on the membrane, which covers it over; when ruptured, it runs off, and offers a fluid, which has the consistence of a very thick milk, or of a very turbid emulsion.

On considering that the shell of the egg is formed in one day, one is astonished at the quantity of calcareous carbonate which abounds in the oviduct of *hens*, and the promptitude with which it is deposited and moulds itself on the membrane which encloses the parts of the eggs.

One very well suspects, and is indeed convinced, that this carbonate has been first separated from the blood, and that it is conveyed to the oviduct by a liquid which serves as a vehicle for it; but one cannot perceive the channel of communication through which this liquid runs from the loins, or another organ into the oviduct.

Lastly, in following the egg from its origin till its emission from the body of the female, we see first, a small yellow globe appear on the ovary, grow on it, and there acquire a certain maturity, then break from it and pass into the channel of the oviduct, there load itself with the different albumens, and then cover itself with a layer of calcareous matter, in adopting a form which is the result of the pressure it experiences in those places it passes through.

Eggs, during their formation, are subject to different accidents, which present species of monstrous things. Two yolks, equally mature, may be detached at the same time from the ovary, pass into the channel of the oviduct, get provided each with an albumen, join afterwards for receiving together the calcareous matter; hence *twin eggs*, that is to say, eggs with two yolks and two whites. Another time an egg arrives in the oviduct, gets supplied with albumen, but it either finds no dissolution of calcareous carbonate, or it has not time to wait till she precipitates this carbonate on the membrane of the egg, and it then comes out without a shell. This is a *soft egg*, which cannot answer well for setting, both on account of its softness, and because it induces evaporation too much. *Soft eggs* are often produced by young birds, which lay for the first time; it is at least a pretty common observation in our poultry-yards. Sometimes the eggs acquire in the

oviduct such a size, as the *hen* is not able to lay them, or perishes in the laying.

In the year 1718, M. Morand, surgeon to the invalids, found a monstrous egg in the body of a young *hen*, which did not lay, and which fell into a languishing state. This egg weighed twelve ounces; the white was as hardened as if it had been dressed, and it was composed of thirty-six distinct layers: the yoke was more liquid than common, and of a paler colour.

Eggs are also to be seen which contain, either in the yoke or in the white, some foreign bodies. There is in the *Journal des Savans* a letter, which informs us, that a friar, in cutting an egg half-hardened in water, found in the middle of the yoke a stone of about the size and shape of a cherry-stone; this stone was as hard and solid as a flint, white inside, having a redish and polished surface; it weighed fifteen grains.

This stone did not arise in the egg; the latter remains too short a time on the ovary; besides it would have been less hard, it would have been composed of successive layers, and tinged like those which grow in the bladder, in the loins, in the gall bladder. It seems it was a little pebble stone swallowed, as usual, by the *hen*, but propelled from the digestive organs as far as the ovary, through an unknown channel, owing to a defect peculiar to itself. The *Journal de Trevoux*, of 1712, mentions a *hen's* egg in which was found a horse hair, which made several contours in the white, without entering the yolk. What route had it taken to get into the oviduct? the same doubtless as that of the stone; the same that conducts thither the thighs of May-bugs, which are also sometimes met with in eggs.

In 1742, Petit shewed an egg-like body found in the white of an egg; it had four layers; the most external was pretty solid; the fourth being opened, a liquor similar to the white of egg ran off. Country people are persuaded that *cocks* sometimes lay small eggs without a yolk, and that these eggs, hatched in dung, give birth to that species of serpent called *basilisk*. A *cock* accused of this dangerous fecundity before Lapeyronnie, the latter dissected him, and finding neither eggs nor ovary in him, he judged that the *cock* had not, and that no *cock* whatever could have the faculty of laying. Soon after, a part of his judgment was confirmed by the discovery he made of the *hen*, which, through some defect in make, had produced

eggs attributed to the cock, and which, since the death of the cock so falsely accused, continued to lay eggs of this sort.

After this explanation given by Lapeyronnie, the learned have thought they might regard as absurd the opinion of breeders concerning eggs called *cock's eggs*, and concerning the pretended basilisks arising therefrom. However we shall perhaps be obliged to re-examine, whether in fact *cocks* cannot, in some circumstances, give, as *hens* do, eggs without yolks; for Vauquelin, in making the analysis of the *cock's* excrements, has found that the white matter, and in a manner cretaceous, which encloses or accompanies them, was a true albumen; that consequently there was preparing already in the organs of that bird one of the substances of this sort of eggs.

Therefore, in order to make one entirely in the body of a *cock*, it would suffice, according to this celebrated chymist, that a certain quantity of glare, or albumen, collected together in the cloaca, should there remain for some time; and that the urines, on arriving thither, should cover it over with the carbonate of lime, with which they are always saturated. Vauquelin never had occasion to observe such a phenomenon; but so many people say they have seen it, and this opinion is so generally diffused throughout the country, that it appears to him difficult to believe that there should not be any thing in it. Under the circumstances mentioned by Vauquelin, eggs produced by *cocks* would not be more astonishing than those found in the wen of friar Berard, a capuchin of the convent of Forges, in Normandy. There were forty in this wen, if we may credit the *Mercur*e of May, 1684: some were like a *hen's*, others like *pigeons'* eggs. It would not be more astonishing than those vesicular bodies of an oval figure, some as big as nuts, the others as big as small eggs, which were filled with a transparent viscid liquor, and which came out of the fundament of a man, quoted in the volumes of the Academy of Sciences for the year 1704.

Eggs of Poultry-Yard Fowls.

Eggs are, by nature, destined for the propagation of birds; but they do not always answer this end. Animals destroy a great many, because in them they find food of which they are extremely fond. Man, who shares this

taste, but who was often behind-hand with them in the search after the nests that contained this precious aliment, has thought of collecting together, of rearing and taming at home with him, those species of birds which supplied it in most abundance, and was most palatable.

Hence, those females of birds which stock his poultry-yards, and which are known by the names of *fowls, turkies, ducks, geese, pintadas, &c.* which he has domesticated for to be able, at pleasure, to allot their eggs, some for eating, others for supplying young ones, either for renewing the breeds, or for fattening and serving up at table, as very substantial and very palatable aliments; and such is the success of this his speculation, that in procuring these birds a comfortable lodging, an abundant food, well-managed treatment, he has succeeded not only in favouring, but, moreover, in considerably increasing their propagation, in varying their species, and in perfecting their results.

The eggs of birds of the poultry-yard, are, in general, good to eat. They make use in the country of those of *turkies, geese, and ducks*; they are eat in the shell, or in omelets; they are used in pastry; they are dressed every way. But these eggs are not the object of a trade. 1. Because the females that supply them, are, in general, very little multiplied; 2. Because laying but a small number of eggs, all, except those of the second laying, are employed for the reproduction of the species.

Hen's eggs are the only ones in daily use, as well in town as in the country, either because they are the best and the most delicate, and that *hens* are, of all females in the poultry-yard, the most numerous, the most fruitful, and the most easy to rear. They present, in a word, such excellent food, that it would be doing a great injury to society to deprive it of them, and to have all the eggs set on for the purpose of hatching *chickens*.

Avicenna used to say, that the yolk of an egg, when swallowed, produced a quantity of blood equal to its own.

Hippocrates, and since him all physicians, have looked upon eggs as one of our best aliments; they nourish those that are convalescent, without laying heavy on their stomachs; they strengthen them much better than any other nutritious substance. They go through all the processes of the kitchen; but the plainest way of

dressing them, is to cook them in the shell, with the precaution of not letting them get hard, and especially of using them recently laid. One succeeds in coming at the exact point in dressing, by plunging them for a moment in boiling water, or again, in putting them with water on the fire, and in taking them out of the water as soon as the first bubble appears on it. This last method is preferable, as the eggs are boiled more equally, and the yolk has been better reached by the caloric.

When eggs are stale, are addled, and have a disagreeable smell, they may hurt; but as an ancient author bluntly says, it is an easy matter to remedy this inconveniency, by eating new-laid eggs only, and throwing away those one suspects to be stale.

Eggs are not only used as an aliment, they moreover serve as a medicament.

The yolk beat up in hot water and sugar, forms what is called *hen's milk*. It enters into *looks*, and becomes the medium of the union of rosins, both dry and liquid, with watery liquids.

An oil is extracted from it, after it has undergone a certain degree of torrefaction, and which is to be recommended in many circumstances.

The white of egg is employed in collyriums for the eye. It has the property of clarifying syrups, whey, vinous liquors, drinks. The shells when washed, dried, ground on porphyry, have the same virtues as crabs' eyes.

Eggs are also of use in the arts. The yolk takes grease spots out of clothes. With the white of an egg a varnish is made for pictures.

By a mixture of the white of egg and lime, an excellent lute, or clay, is formed for mending broken china, and for binding the fat lute that unites two second-hand vessels.

With birds in general, the eggs of the first lay are not so large as those of the other layings. Those of *hens* are not only subject to this law, but their size varies again according to the species of *fowl*, according as the laying has been more or less hastened, and according to a number of other incidents; so that it is yet a problem to be resolved as that of knowing whether one *hen* that lays double what another does, really supplies a more considerable mass of aliment than that which gives them larger. There are some persons, who, having observed that a well-fed *hen* laid fine and large eggs, whilst another *hen* of the same species, and sparingly fed, produced but

very small ones, have imagined that if the Picardy eggs are, as it is remarked, infinitely smaller than those of Upper Normandy, and especially than those of the environs of Le Mans, 'tis not so much on account of the variety of *fowls* existing in those different parts, as because the lands of Picardy are not so good, nor the corn so nutritious.

We are not of that opinion: 1. Because we see in Paris, two *hens*, sharing the same food, lay eggs of different sizes, when they are themselves of a different size. 2. Because we know, that in Egypt, where the soils are more fertile, and where corn is as nutritious, as in Normandy, the eggs are much lesser than those we get from Picardy, by reason that the *hens* are there very small; 3. Because, in fine, we believe that the corn of Picardy, supposing it to be inferior to that of other countries, is still good enough to feed *hens* well, and make them produce eggs as big as their nature will allow. The weight of a *hen's egg* is usually from one ounce six drams, to two ounces two grains.

On examining an egg of this latter weight, it will be found that the eighteen drams are usually allotted as follows: two drams for the shell, five drams for the yolk, and eleven drams for the white. Therefore Hoffmann was mistaken, when he pretended that the white weighed three times as much as the yolk.

There are some people who endeavour to determine *hens* to increase the size of their eggs; but that is useless, and oftentimes dangerous. The only way to succeed in getting large ones, is, as we have seen further back, to stock the poultry-yard with the best breeds of *fowls*.

Eggs recently layed, are esteemed. Fabricius ab Aquapendente points out the means of knowing whether they are *new laid*, or not. He recommends the holding of them up to the light of a candle: if the humours they contain are clear, fluid, and transparent, they are new; if, on the contrary, their transparency is turbid, it is evident that they have experienced some alterations, and that they consequently are stale.

He advises, in the second place, the putting of them near the fire: if they exhale a moisture, it is a proof that their shells are not yet totally dried, that the first albumen has lost nothing of its fluidity, and that they are consequently new.

Stale eggs have, inside, a vacancy, which gives the measure of the loss they have experienced; and, as it is already perceivable in an egg laid since three or four days, and, as it gradually increases, dealers in eggs have imagined to judge of the egg's age, by the size of this vacancy, and habit leads them to make this estimation very accurately; this vacancy always exists laterally towards the great end, where it is more or less distinct; according to the egg's age. One sees that it is formed by the shell on one side, and on the other by its immediate membrane, which is come off. It is occupied by a certain quantity of atmospheric air. When this egg is turned over, nothing similar is ever to be perceived at the small end. M. Lèveillé gives this vacancy the name of *air-cell*.

The evaporation which takes place in eggs, is such, that a new-laid egg, weighing 1025 grains 1-3, put at Stockholm in a window, lost in eight months, 222 grains 3-4 of its weight.

Eggs kept in water, are sometimes sold for new-laid eggs. They are, indeed, as full, they have as much milk as the others when they are dressed, but the flavour is altered.

Delicate palates find also, some differences in the taste of eggs, according to the aliments which the *hens* have been fed with. Grain determines in these eggs a slight flavour which does not resemble that procured by grass, and when the *hens* swallow a great many May-bugs, or other insects, in the season when they abound, eggs are very disagreeable to eat. Barley gives the colour of the yolk a deeper cast, and makes it more delicate.

Lastly, fir-tree buds eaten by the *hens*, give the eggs an odour of turpentine.

Preservation of Eggs.

Hen's eggs having become almost an absolute necessary, one has endeavoured to preserve them like the other commodities of the first importance.

One has thought of preserving them, 1. From moisture, which aided by heat, communicates to them a motion of fermentation which alters them. It is so fatal to them that should one single drop of water remain on a new-laid egg for some time, it corrupts the part of the white it has touched through the shell. The spot it has

imprinted increases till the pellicle that covers the yolk be attacked; the egg is then lost, but if the yolk is not attacked, by taking away the spoiled part, the rest is still good.

2. From the frost, which in cracking the eggs and disorganizing the inside disposes them to be putrified. It sometimes happens that an egg freezes without experiencing any crack, but the thaw coming on, if it is not soon used, it would spoil with the greatest expedition; it is the same with meat; dress it when it is frozen, it is passable, submit it to cooking after having let it thaw, it is already altered.

To compass these views, some put eggs in a mixture of bran and salt, others insulate them in heaps of corn and rye; some arrange them in saw-dust, others in ashes; a great many place them on beds of straw or bran; there are some, in fine, who prefer stratifying them with very dry rye straw, the point downwards, in baskets, and afterwards to put by the baskets in places neither too hot nor too cold, and where they may not be exposed to the emanation of putrid gasses.

But as all these means are not very efficacious for preserving them a long time; the breeder does not think of making egg-warehouses. Spring is the season during which *hens* lay so abundantly, that he may depend on their not failing; he will immediately carry to market what exceeds the consumption of the house.

And, as in winter, the *hens*, diseased with moulting, or benumbed with the frost, leave off laying, 'tis only when the cold weather comes on, that he will collect together as many eggs as possible, as well for his own kitchen, where they then are of the greatest resource, as for the market, where they sell much dearer than at any other time.

He devotes himself so much the more to this store, in the later summer months, as experience has learnt, that eggs laid, from the month of August till the month of October, go much more safely through the winter. It sometimes happens, that *hens* which have laid in spring, give a few eggs during the months of December and January: these are kept with the utmost care for the month of February: this resource is not wanted for the month of March, for the young *hens*, and especially those that have not set the preceding year, lay abundantly throughout this month.

In Picardy it is particularly lace-makers who undertake

to preserve eggs for selling them in the season when *hens* have left off giving any; they buy fresh eggs at the farmer's during the months of October and November, they put them on shelves placed against the walls of their rooms, they are there sheltered from the cold; they turn them very often, to prevent the wood, which might contain some dampness from communicating it to them; every week they shew these eggs to the light; those that have lost, through evaporation, are forthwith sold to dealers in eggs and poultry, who carry them either to the market at the neighbouring town, or straight to Paris.

But where one wanted to form a magazine of eggs in fortified places, in very populous towns, or in fine, when one wanted to stock ships with this article for a long voyage, what would be the means that might be employed for preserving them from any alteration for a good length of time? Reaumur pretends to have found one as plain as it is easy to perform. In order to have, says he, in every season eggs constantly fresh, eggs, among which no spoilt ones ever occur, it is sufficient to intercept the perspiration that takes place in each egg, to prevent the communication of the air with the matter therein contained, and by that the fermentation that might alter them.

There needs no more to be done than to rub the shell carefully all over with a varnish, impenetrable to water, or plainer still, with oil or grease, being cautious to rub the fingers backwards and forwards on the surface, in order to be sure that there is no part of the shell that is not imbibed with oil, grease, or butter. The eggs so prepared, adds Reaumur, suffer no evaporation; every thing in them remains at rest; it matters not how old they grow, they always constantly remain fresh.

How could a means which, after this author, would have prevented the loss of that enormous quantity of eggs which spoil, in endeavouring to preserve them, which would have lowered the price of that commodity, which would have given in abundance fresh eggs in the season when none but old ones are to be got, which would have procured seamen, out at sea, the invaluable advantage of eating excellent eggs, how could such a means that interests all mankind have been neglected? Why did not the government, into whose views it must necessarily enter to study the preservation of all commodities, and

more especially of such a precious one, why did not the government, for more than fifty years that this means was thought of, advise the inhabitants of the country to grease their eggs as soon as laid? Why did it not order that none should be put in trade but such as should have gone through this preparation, under the penalty of confiscation?

Most likely a great deal must be rebated from Reaumur's magnificent promises.

In fact, eggs not only spoil through the loss of the moisture which ruptures the equilibrium of their constituent parts, they do not spoil only because they receive, in exchange for their moisture, putrid miasms. There exists another cause of corruption, which has not escaped egg-dealers; a long experience has taught them that they could never depend on being able to keep a long time such eggs as had undergone any removal whatever. What is the reason of it?

It is, that in the land-carriage, eggs suffer the jostling of carts; and that in sea-voyages they are hurt by the keeling of the ships; that these motions, more or less rough, disorganize the internal parts of the egg; that they break the ramification of the vessels, by which the sperm was secured to the membrane of the yolk; that this sperm, deprived of the organs that kept it alive, dies, grows tainted, and taints all that surrounds it.

Therefore, in addition to Reaumur's process, the eggs should not be removed by land or sea, but with a caution to suspend them, so as that every motion that might prove hurtful to them, might be broke off; and one does not then feel completely easy against all danger, when one considers that the sperm, without experiencing any accident, may die; and that it is dead in an egg kept beyond the time when it may yet be hatched; perhaps a little thunder only would destroy the sperm even in fresh eggs. It is generally believed, that this meteor produces that effect on the embryos of eggs that are hatching. Should it not be possible that it might produce a similar one on those of eggs that are housed; we know that in these organic bodies, corruption always begins by the sperm.

Under these considerations, the most efficacious means of all would be, to think of preserving and removing none but unfecundated eggs, that is, eggs lain by *hens* that have no connexion with *cocks*.

Experience has proved, that the eggs that are named *clear*, resist, without spoiling, a temperature of thirty-two degrees continued for thirty or forty days, that they only lose some of their moisture by an evaporation that exhausts their juices.

Now, in order to have eggs capable of keeping eatable, without any preparation, from spring till the end of winter, they should have been lain by *hens* deprived of at least a month of the *cock's* approach; and if they had been intended to be kept longer still, they should have been varnished or greased.

The three eggs found, as they say, very sweet, after a residence of three hundred years in the wall of a church; in the Milanese, have not, most likely, presented this astonishing phenomenon, only because they were *clear eggs*; and that their perspiration had been intercepted by some cause not less efficacious than that given by varnishing.

Eggs are again preserved by the means of salt. It consists in arranging eggs in a barrel with salt; first a bed of salt, then a bed of eggs, and so on alternately till the barrel is full. It might be feared, that the damp which salt attracts might hurt the eggs, but as it only penetrates but with the salt, which it keeps in a dissolvent state, it appears, that so far from altering them it contributes to keep them in a good condition.

Another way to preserve eggs is to have them cooked in boiling water the same day as they are laid, as for eating in the shell; on taking them out of the water they are marked either with ink, with pencil, or with charcoal, in order to be enabled to employ them according to their age, then they are put in reserve, in a cool place; they will keep there for several months; when one wants to use them, they are warmed in water heated to a proper temperature; they resemble, in point of taste, new-laid eggs, not one day old. The part, improperly called the *milk*, is so abundant in them, that the nicest people are mistaken by it. It has been observed only that at the end of three or four months, the membrane that lines the egg gets somewhat thickened.

This means is employed in Scotland since many centuries, and even by some of our own country people. There are some people who, in addition to this process, put the egg, so dressed, in salt, and only take them out but in proportion as they are wanted.

On seeing towards the end of winter, and chiefly in the country, the market filled with eggs variously coloured, some think they detect, in this singularity, a trick of the egg-dealers to get rid of the remains of their stock, to be able, by the help of a colour that takes the fancy of the vulgar, and children especially, so to sell off even the eggs half empty, those even in which whole *chickens* are found, *chickens* dressed in the shell; others, not less persuaded that this colouring has been invented by the dealers, think that their proposed end was to prolong the existence of the eggs, to let them go at a low price in a season when the poor would be totally deprived of them; they think that, far from deceiving, the dealers give information by the colour they give their eggs, that they are not only dressed, but that they are moreover old, especially when they are put out for sale before the month of March.

As for us, considering that in Paris there are scarcely any coloured eggs till Easter, that all those sold there at that time are usually, and almost necessarily fresh ones, considering that all the trick which the stainers of eggs employ, merely exists in that colour which deceives the eye of the purchaser, and makes him take eggs which he would have refused as being too small, had they been white, we are not persuaded that the custom of staining eggs be an invention of the dealers; and without disputing the abuses it incurs, according to some, or the advantages it procures, according to others, we assign it the same origin as that which has been attributed to it by the author of *La vie privée des Français*. This is an abstract of what he says of the matter:—When one thought of forbidding eggs to be eaten in Lent, the people found themselves very destitute; they bore with pain the privation, during forty days, of such a delicious aliment, although very common; they saw with the greatest joy that day arrive when they might again make use of them; but as they were devout, they thought they ought to have the eggs hallowed before regaling themselves with them. In consequence, the custom was introduced on Good Friday and Easter Sunday to present them at church; when they were brought back to the house, some were sent to friends or relations, it was giving them Easter eggs; and soon, in order to deck out the present, they were stained in red, blue, they were pinked and spotted. The then king, himself received and distributed eggs painted and gilt.

Hard eggs, when they have been dressed recently laid, have the advantage of keeping a long time, and of being conveniently removed and carried about. It has been thought, in the East Indies, of rendering their preservation still more assured; they are salted at the same time as they are dressed; they are done over with a paste made with clay, cinders, and sea-salt, and put together in an oven.

In England, to attain the same end, they mix a bushel of quick lime, two pounds of salt, and eight ounces of cream of tartar together; a sufficient quantity of water is added, as one egg may plunge in to the point; when the composition has this consistence, the eggs are put in. Gagne assures us, that by this process eggs may be kept perfectly sound during the space of two years at least.

In fine, the last means of preservation, as formerly practised, is to beat up the yolks of eggs in vinegar; with this mixture casks were filled; and it formed one of the commodities with which the army was supplied; we are not acquainted from what motives this alimentary does not any longer take place.

Note on the Caponing of Fowls.

CAPONS.—As the art of *caponing fowls* forms a part of rural economy, and as the mode of performing the operation in Britain is not, by any means, well understood, the following account of the Chinese mode of making *capons*, cannot fail of being interesting:—

The wings of the *fowl* being folded back till they meet, the left foot of the operator is placed on them, the *fowl* laying on its left side; the great toe of the right foot is placed on its legs; the feathers are then plucked off by the side; an incision, about an inch in length, commencing about an inch from the back-bone, and extending obliquely downwards, is made with a knife, the cutting part of which is the bevelled point, this is carefully carried through the skin, muscles &c. &c. till the intestines are laid bare; flat blunt hooks are then put into the incision, which is extended and kept open by the elasticity of a bamboo or whalebone; the intestines are then pushed aside with a forceps; the testicle being now seen, is laid hold of by the forceps till the horse-hair, through the bamboo or elder tube, is passed over it; the hair is then drawn backwards and forwards, through the tube, till the spermatic cord is drawn asunder, the testicle is then removed with a scoop; the other testicle is then removed in the same manner. No blood issues from the cords, nor does the animal seem to feel any pain. The hooks are now removed, the wound closed, the feathers which were plucked off, are stuck upon the wound with the blood, and the wing being put down on it, the animal walks off as if nothing had happened to it.

British Farmer's Cyclopedia.

Fattening Capons.—Horsham, in Sussex, is the great emporium of *capons*; they are there fattened to an extent unknown in other places; when fully fed, they often

exceed nine pounds in weight; their food consists of coarse barley meal, milk, and the skimmings of the pot, that is something which is greasy; but for finishing, they depend on good and sweet molasses.—**DOCTOR HUNTER.**

FINIS.